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ABSTRACT

Libraries offer a variety of services and play an assortment of roles. While few people disagree that libraries have been valuable institutions in the past, many wonder how necessary they will be in the future. Shrinking budgets make it harder for libraries to contradict these perceptions. This report examines the social and economic impact that libraries have made in the past and how they can continue to contribute in this age of information and network technology. There are numerous ways for Texas libraries to be vital information providers in the 21st Century, but all of them require more funding. To attract more funding, libraries need to change their image, update their services, and demonstrate more vividly the value they add to print and digital information. In turn, to ensure the successful continuation of valuable information services, governments, private contributors, and the general public need to recognize and reward libraries that further education, equitable access to information, economic activities, and community service. The report consists of 5 sections: (1) Libraries--historical summary and social and economic impact of libraries; (2) The Information Age; (3) Library Roles in the Information Age; (4) Funding--public funding, entrepreneurs, and free versus fee; and (5) Recommendations and Conclusion. (SWC)

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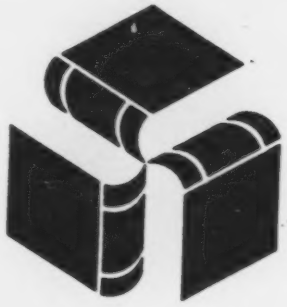
Libraries In The Information Age



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Libraries In The Information Age

A Report to the
Texas State Library and Archives Commission

Prepared by the Texas Research League
July, 1995

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The Texas Research League is a nonprofit, educational corporation engaged in objective analysis of the operations, programs, and problems of Texas government. The League is financed by public spirited citizens through annual contributions.

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This study was aided by the generous support of
The Texas Library Association

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Dear Dr. Martin:

It is my pleasure to submit to you, on behalf of the Texas Research League officers, members, and staff, this report on libraries in the information age. As you requested, the report examines the social and economic impact that libraries have made in the past and how they can continue to contribute in this age of ubiquitous information and network technology.

Libraries historically have been valuable assets in every community they have served -- be it a school, university, city, town, business, or government. By building on that tradition of service, via technological upgrades, interdisciplinary strategies, and assertive outreach efforts, libraries can position themselves to be vital institutions in the 21st Century.

Libraries' primary goal should be to assure access to the information technology and resources that are transforming society. Therefore, libraries without network connections must find a way to initiate one. Additionally, since access requires knowledge, librarians should further information literacy by assisting patrons in learning how to use tools and assess resources. In this way, libraries will be invaluable in diminishing the gap between the information haves and have nots.

At the same time, providing library services appropriate for the information age will cost money. While libraries should be assertive in pursuing alternative revenue and reallocating resources, government and funding bodies also need to recognize the value of library services and support library efforts to make print and electronic information accessible, educational, and enjoyable.

Sincerely,

Gary E. Wood

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TABLE OF CONTENTS

EXECUTIVE SUMMARY vii

INTRODUCTION xiii

I. LIBRARIES 1
- Historical Summary 1
- The Social and Economic Impact of Libraries 4

II. THE INFORMATION AGE 11
- The Information Economy 12
- Texas' Position 13
- Libraries' Position 14
- Networks 14
- Texas State Networks 20
- Texas Library Projects 21

III. LIBRARY ROLES IN THE INFORMATION AGE 27
- Provider of Universal Access to Electronic Information . 28
- The Virtual Library 34
- Entrepreneurial Information Provider 38
- All Purpose Collaborator 43
- Advisor for Information Policies 47

IV. FUNDING 53
- Public Funding 53
- Entrepreneurs 55
- Free versus Fee 56

V. RECOMMENDATIONS AND CONCLUSION 61

Executive Summary

Libraries have a long and diverse history of providing a myriad of information services to a multitude of citizens. As the U.S. Department of Commerce's Information Infrastructure Task Force described, "libraries are adjuncts to education, a base for generating innovative thinking, a stimulus to culture, and an aid to the individual self-development of citizens."

The Social and Economic Impact of Libraries

To satisfy so many different people, libraries have to offer a variety of services and play an assortment of roles. Libraries ensure that constituents can find and use relevant information and desired sources in an efficient manner. Librarians select and organize materials into a collection, adding value to information.Furthermore, library benefits extend beyond those who come into the building. Supplementing education, supporting an informed citizenry, creating demand for products, and strengthening communities, effective library services benefit people who never set foot in a library.

Perhaps most importantly, libraries increase and ensure access to information. By facilitating access, libraries act as a social safety net removing barriers faced by information "have nots" -- the economically disadvantaged, the undereducated, and/or rural populations. Without the library safety net, the privileges of the affluent in the high technology, information age become that much more advantageous, and the disadvantages of the lower classes become that much harder to overcome.

Networks and the Information Economy

Library services have the potential to become even more valuable because economic and technological advancements are making

information an essential and ubiquitous commodity. Today's workforce is dominated by knowledge and service workers whose jobs revolve around creating, manipulating, and applying information. "Knowledge formation," consisting of formal education, continuing education, and research and development, is the largest investment in every developed country. Moreover, information increasingly is an essential public resource. Maintaining the free flow of information is a worthwhile investment when it contributes to successful commercial ventures and to an improved standard of living, and a priceless endeavor when it empowers people to fully participate in the democratic process, to join together in a common heritage or interest, or to aspire to a better life.

Understanding the context of the networked environment is important for understanding its potential. The technology is practical and flexible. Federal, state, local, and private participants are promoting the resulting information applications. As experienced information navigators, librarians require both the incentive and the resources to capitalize on the new applications and to develop cost-effective services that meet constituent needs and desires.

Library Roles in the Information Age

Nevertheless, despite the wealth of opportunities, depictions of libraries in the future often range from non-entities replaced by virtual reality to temporary stakeholders lending a hand during the transition from print to digital formats. The problem is one of image and economics. While few disagree that libraries have been valuable institutions in the past, many wonder how necessary they will be in the future. At the same time, shrinking budgets make it harder for libraries to contradict these perceptions.

Applying lessons from library history will help improve the image. For example, adapting the age-old role of an information gateway to the networked environment will ensure libraries a place as essential 21st Century institutions. Libraries that make network technology not only available, but practical and convenient will become valuable assets in any environment.

Obviously, physical libraries cannot capitalize on the emergence of virtual libraries if they do not have access to networks. Many

librarians and information experts advise libraries without Internet access to establish some kind of connection, no matter how limited, and to build from there. After learning how to use it and accumulating success stories, librarians will be in a better position to prove its value to the library and to secure additional support for initiating and maintaining network services.

At the same time, funding bodies that fail to provide libraries with adequate resources risk impairing the institution's ability to continue providing economic and societal benefits. These bodies need to recognize the importance of library services in the information age and to help libraries fill in the gaps left by the sweeping changes in computers and telecommunications with enhanced traditional services and relevant new ones.

There are several strategies that the library community -- including governing bodies and supporters -- can pursue to maximize library contributions and funding.

- Libraries should "reinvent" themselves from bureaucratic institutions to entrepreneurial information providers with an emphasis on responsiveness and accountability.

As part of this process, librarians should be assertive in publicizing their services. They need to inform constituents not just how many computers or databases are available, but what the advantages are of using the services that information professionals offer. Then, libraries can point to concrete examples of the benefits they confer to leverage more funding. In turn, financial supporters should help libraries maintain or expand useful services.

- Libraries should strive for more collaborative relationships with public and private information suppliers and consumers.

Whether these relationships lead to a more organized Internet, wider access to electronic information, more productive use of information, a more competitive workforce, or simply more enjoyment of the new technology, libraries that complement many segments of society, while also maintaining their own independent contribution, will be a valuable resource.

- Librarians and policy makers should cooperate in the development of the state and national information infrastructure.

Since libraries span the continuum of network access, from barely a personal computer in the facility to full Internet access and networks of locally mounted databases, librarians collectively have a valuable perspective to offer. If they are successful in translating their varied experiences into persuasive insights that influence the formation of information policies, libraries, and society in general, will benefit by the adoption of laws and regulations that are conducive to library growth and widespread access to information.

Funding

Preparing for a high-tech future of reliance on and access to information resources will cost money. Since Texas libraries are funded well below the national average, most will not be able to provide adequate, never mind exemplary, digital information services under existing funding levels. Given the benefits that libraries offer in education, training, and overall information services, the resulting limitation on libraries is shortsighted. For libraries to meet the information needs of Texans in the 21st Century, and for the state to meet the goals of a healthy economy and an informed citizenry, state and local governments need to increase funding to libraries.

For their part, libraries should continually reassess their use of resources. Communication with users and staff will inform decision makers about what kinds of services are necessary or desirable, what kinds of cuts will be acceptable, and how to guard against exclusionary effects. Additionally, assertive marketing efforts will persuade public and private sources to reward libraries with grants and financial support.

Still, it is unlikely that these efforts will be enough. To provide a full range of digital and print services, libraries should consider expanding user fees. Fees offset costs for supplemental services and encourage libraries to be more "market driven," and hence more responsive to patrons. The higher education system provides a framework for designing tiered fee structures that minimize inequity. The library equivalent of elementary and secondary education should

remain available at little or no cost, but as services that require more skills and impart more return on an investment are made available, libraries should feel more comfortable charging for their effort. Like other components of library evolution, an effective fee structure should sustain quality services and discourage expensive duplication, while supporting a safety net that ensures equitable access to fundamental skills and information resources.

Recommendations

It is in Texas' best interest that libraries be capable of capitalizing on information's educational, economic and technological features. The rate of technological change and the volume of information present excellent opportunities for libraries, with the support of governments, communities, businesses, organizations, and individuals, not only to survive in the networked information age, but to successfully log another chapter onto a history of service as a public, economic, and civic resource. The following recommendations are made to encourage that development.

- Libraries, policy makers, and financial supporters should focus on the goal of universal information literacy.
- The Texas State Library should take the lead in assisting public libraries to at least obtain network connectivity.
- The library community should ensure that the vision of the virtual library includes a full range of information services.
- To adapt to rapid technological advancements and the changing political and economic climate, all libraries should become more entrepreneurial.
- Librarians should consistently think of users as customers.

- Librarians must acquire the skills necessary to strive for innovation while keeping an eye on the bottom line.
- All information service providers need to be receptive to collaborative relationships.
- Policy makers and libraries should collaborate in the development of information policies.
- All levels of government should increase funding to libraries.
- Libraries must actively and independently seek alternative funding sources.
- Since it is unlikely that many libraries will receive enough money to satisfy demand for high-quality digital services, libraries should consider expanding user fees.
- Further research should be conducted on library contributions, concerns, and needs.

Conclusion

There are a myriad of ways for Texas libraries to be vital information providers in the 21st Century, but all of them require more funding. To attract more funding, libraries need to change their image, update their services, and demonstrate more vividly the value they add to print and digital information. In turn, to ensure the successful continuation of valuable information services, governments, private contributors, and the general public need to recognize and reward libraries that further education, equitable access to information, economic activities, and community service.

Introduction

Texas libraries have played an important role in society since the days of the Republic. They have helped people learn to read, find a job, start businesses, develop hobbies, stay informed about current events, succeed in school, and enjoy the pleasure of curling up with a good book. They exist in schools, colleges and universities, businesses, and communities, all providing more affordable access to information. Their constituents have an almost limitless range of needs and abilities. By guaranteeing all of them access to information, libraries diminish the inequities that exist among people from different backgrounds and among organizations with different bottom lines.

Librarians perform a myriad of services. In addition to selecting and organizing materials, they ensure that access to information does not become inadvertently limited due to lack of experience or lack of time. They also support communities by assembling relevant collections and storing local or specialized information. The expertise and organization inherent in libraries' services add value to the information found there. Between libraries' holdings and librarians' skills, these institutions have historically benefitted users from all walks of life and with all types of considerations.

The growing status of information in the economy makes library services that much more important. More and more jobs depend upon information as a commodity. Economic growth depends upon using this commodity productively. The surge in interactive computer networks is escalating the ways and means of creating and communicating information. The fascination with the Internet and the campaign for a National Information Infrastructure inspire visions of a networked society in which everyone has the opportunity to participate in the creative and economic happenings of the day.

Technological advancements are making the potential for change appear unprecedented. The Internet, CD-ROM, portable laptop computers, and modems all conjure the image of universal and constant access to people across the country, to information from

around the world, to movies on demand, and to customers for every product and service imaginable. If everyone can tap into this virtual world from home or work, and retrieve full-text documents whenever they want, who needs libraries? If universal access to the information highway is achieved, will libraries become little more than archives for hard copies of electronic information?

At the request of the Texas State Library and Archives Commission, this report examines the ramifications of these questions for Texas libraries and the different levels of government that fund them. Texas has been a leader in the development of the information highway, and Texas libraries have been upgrading their facilities and services to satisfy new demands. It is beyond the scope of the report to catalog all of these efforts. Instead, informed by librarian focus groups, numerous interviews, and an extensive literature review, it presents a broad overview of the issues libraries face, the social and economic impact they make, strategies they can pursue to position themselves as essential information service providers in the digital age, and the assistance they need to remain optimally useful.

Chapter 1 provides a summary of library history and a description of traditional library services and contributions. Chapter 2 introduces the information economy and the computer and telecommunication advances that are transforming society. Together, they define the context in which libraries are operating.

Chapter 3 analyzes the long-term strategies libraries should pursue to remain valuable. Given the historical and social context in which libraries function, and the evolution of a society increasingly reliant on information and information technology, libraries have many options for assuring their future role as indispensable information intermediaries. Incorporating entrepreneurial and collaborative methods into a strategy focused on expanding access and embracing information technology will help public and private libraries demonstrate their value and invigorate their image as information providers. This reinvention process will bolster efforts of the library community to influence regulatory and funding decisions into the 21st Century.

In the current political and fiscal climate, library vitality also requires consideration of multiple funding sources. Chapter 4 exam-

ines libraries options for raising necessary revenue to meet users' expectations and to stay competitive without abandoning the information safety net that traditional free library service supplies. Additionally, while much emphasis is placed on library responsibility to stretch dollars and unearth money, these efforts are not expected to be sufficient. Governing bodies and financial supporters also need to recognize the gains imparted to all of society by library services and reward libraries accordingly.

Libraries and governing bodies both face tough choices in service provision and resource allocation. Chapter 5 summarizes the recommendations implicit throughout the report regarding those choices. By building on their traditional roles as information organizers and navigators, and adding contemporary management strategies and advanced technology, libraries will be better able to garner support from funding bodies and patrons. By recognizing and rewarding library achievements, state and local governments, private contributors, and the general public will be better able to maximize the potential of an institution that furthers education, equitable access to information, and community service.

Chapter 1

Libraries

Libraries often are taken for granted. Unlike schools, libraries generally do not arouse the kind of individual concern that triggers reform efforts or that protects budgets. Yet, libraries are one of the first institutions that communities and organizations establish, in large measure because they serve many diverse functions. Libraries face the challenge of attracting attention and gaining appreciation for their past success; of demonstrating the future benefits they can offer; and of remaining relevant to constituents.

Before delving into library strategies and funding needs, it is important to understand the roles that libraries have played in the past. Each individual library has fulfilled an assortment of responsibilities. Each category of libraries has focused on certain population groups. Multiple tasks and evolving services have translated into institutions entrenched in the social fabric. Summarizing libraries' history and traditions will illustrate the impact they have had on society and the contributions they have to offer in this fast-paced technological age.

Historical Summary

Information's function as a valuable resource and libraries' role as a conduit to information have been firmly established since the very beginning of the nation. The founding fathers supported libraries because they wanted an informed public for the new democracy.[1] The emphasis placed on access to information, along with the relatively

high literacy rate in early America, spurred the growth of public and semi-public libraries.[2]

As the country grew in the 19th century, the spread of democracy and public education, along with increasing occupational specialization heightened the demand for reading skills. Rising prosperity and the growth in book publishing increased the demand for books. As a result, libraries became more common. The early social libraries, supported by individual subscriptions, evolved into tax-supported public libraries.[3] In Texas, for example, women's clubs started many public libraries informally, laying the foundation for local governments or non-profit corporations to later assume responsibility.[4] Andrew Carnegie, believing "there was not such a cradle of pure democracy upon the earth as in the free public library," encouraged this trend by parcelling out funds for the construction of libraries in communities throughout the continental United States.[5] Texas' first Carnegie grant was awarded to Pittsburgh, Texas in 1898. Houston and Dallas received grants the next year, followed by many other towns and cities.[6] Sometimes private philanthropy discouraged public support for libraries, but more often it helped to establish the local library as an important community institution deserving of public funding.[7]

By the end of the 19th century, academic libraries also were maturing into their modern form. Many American colleges were expanding into research universities that required libraries with substantial holdings, which, in turn, created the need for more organization and classification. In response, academic librarians followed the lead of public librarians and added service components -- that of reader's advisor and reference librarian -- to their work.[8] Special libraries, such as company libraries, legislative reference services, and specialized departments within public and academic libraries, were becoming established at the same time. The demand for professional librarians grew. The founding of the American Library Association in 1876, and the Texas Library Association (TLA) in 1902, further ingrained the idea of librarians as professionals and emphasized their concern about the social impact of their work.[9]

By the end of World War II, academic and public libraries were thriving. To the chagrin of some critics, however, success was measured in the number of books housed, and this encouraged continuous buying. Circulation in large university libraries, in

particular, increased so much that space limitations became a concern. Eventually recognizing that no library could be totally self-sufficient, all libraries began cooperating through union catalogs* and interlibrary loans.[10]

By the 1960s, the influence of public libraries started to decline. As the industrial economy started to wane and the information economy emerged, public libraries increasingly were relegated to an auxiliary position. A variety of reasons explain the demotion, including changes in demographics, weaknesses in public school systems, budget cuts, the popularity of television, and the failure of libraries to take advantage of new technology.[11]

Academic libraries were more successful due to additional tuition revenue resulting from an increase in enrollment and to greater financial support from the federal government.[12] Thanks to the national focus on education at the time, school libraries also fared better. In 1962, more than one-half of American schools lacked libraries. By the end of the decade, the federal Elementary and Secondary Education Act ensured that most schools were equipped with in-house libraries.[13]

To combat the decline of public libraries, the Library Services Act, originally designed to bring public library service to rural areas,[14] was expanded into the Library Service and Construction Act (LSCA). The law was broadened for several reasons. For one thing, elected officials were pleased that the federal money had leveraged sizable increases in state and local funding. Second, the efforts of libraries, publishers, and citizen committees were successful in changing libraries' images from intellectual institutions to multimedia, educational, civic, and developmental resources. LSCA grants contributed to the construction of modern facilities and to the enhancement of services.[15]

The Texas legislature responded to the federal inducements, and to TLA support, by adopting the Library Systems Act of 1969 that divided the state into 10 districts responsible for interlibrary cooperation. With oversight of the library systems and LSCA funds,

* "Union catalog" is a generic term for any listing of bibliographic holdings across multiple libraries.

the Texas State Library (TSL) for the first time was capable of fostering statewide library development.[16] When the Library Systems Act was passed, it applied only to public libraries. After much debate, the legislature amended the law in 1993 to allow all publicly funded libraries and academic libraries to join library systems.[17]

Despite these cooperative efforts, the 1970s were a bleak time for libraries. Academic libraries felt the drain on resources caused by budget cuts;[18] public libraries increasingly became neglected institutions. The booming economy of the early 1980s somewhat eased the strain, especially for public libraries which became a trendy recipient of social fundraisers. In the 1990s, however, every library struggles for resources. At a time of shrinking budgets, the cost of books and journals, as well as the volume of information available, has risen steadily. The need to acquire and maintain technology intensifies the fiscal burden.[19] Libraries face the challenge of continuing to provide access to print resources while securing a place on the information highway.

The Social and Economic Impact of Libraries

As their long and diverse history attests, libraries have provided a myriad of services to a multitude of citizens. These services go well beyond mere book lending or Dewey Decimal system cataloging. As the U.S. Department of Commerce's Information Infrastructure Task Force described, "libraries are adjuncts to education, a base for generating innovative thinking, a stimulus to culture, and an aid to the individual self-development of citizens."[20] They are information-service providers whose clients are not one well-defined, easily targeted group, but an eclectic gathering with a wide range of demands.

To satisfy so many different people, libraries have to offer a variety of services and play an assortment of roles.

- *Library media centers*, providing resources, supplementing curriculum, and guiding instructional activities, serve students and teachers in elementary and secondary schools.[21]

- *Academic libraries*, the traditional center of scholarly research and instructional materials, cater to college and university students and faculty.[22]

- *Special libraries* serve distinct organizations or interests, such as government agencies, hospitals, professional associations, or private companies, and emphasize direct services to users rather than teaching users how to find information themselves.[23]

- *Public libraries* are the catch-all, but with a special obligation to serve the underprivileged and community interests.

All serve as resources for diverse clients and, in many different forms, facilitate access to information.

Traditional Library Services

Access to Information. Virtually everything libraries and librarians do increases access to information. Acquiring, cataloging, and organizing materials makes them available and easy to find. For patrons struggling to find what they want or to simply learn how to use the library, trained professionals stand by to help locate information, explain tools, and assess resources. People know to go to the library to look for information and, in many places, if they cannot get to the library, the library comes to them through bookmobiles or document delivery services.[24] Public libraries especially guarantee that all people, without regard to economic status or geographic location, have access to books, periodicals, reference materials, government information, computers, and the rest of the library's resources. Moreover, many libraries enhance the meaning of universal access by offering literacy programs for patrons of all ages.[25] Thus, beyond ensuring that the public can get to information, libraries ensure that constituents can find and use relevant information and desired sources in an efficient manner.

Additionally, libraries rely on cooperative networks to further access. For example, the advent of networks and telecommunications technology led to large bibliographic utilities, such as the Online

Computer Library Center (OCLC), offering shared cataloging systems of library holdings in machine-readable format.[26] If a library does not have requested material, the librarian searches the OCLC system or a similar union catalogue to find a library that does. After finding where the material is located, the librarian submits an interlibrary loan request. Commercial suppliers, such as Dialog or CARL Uncover, also offer document delivery, usually to obtain full-text copies of cites located during an online bibliographic search.[27] Taking advantage of such resources, libraries broaden the meaning of access far beyond the library walls.

Adding Value to Information. One of the primary tasks of librarians is to select and manage information so that the public spends less time locating it. They build collections of materials by gathering relevant, quality information together in one place.[28] Inherent in this process is the librarian's evaluation of what information will be most useful and desired. In this way, librarians add value to information.

There are different elements to added value, ranging from function to convenience. The collections in hospital libraries, for example, assist administrators who must have reliable, relevant medical information at their disposal.[29] Corporate librarians, similarly, assist businesses by compiling information about competitors, and sometimes by analyzing the competitors themselves.[30] Public libraries create locally relevant referral files for information such as tax codes, census data, newspaper indexes, and genealogy records.[31]

Some special and academic librarians filter information so that the client or researcher is spared superfluous information. This value-added service is labor-intensive and requires a large amount of knowledge about the subject and a trust between the librarian and the user.[32] A librarian's ability to offer this service often depends on the culture of the organization. Some institutions value information management and therefore invest in sufficient resources and staff to allow librarians to do a thorough job. Other institutions value library services less, forcing information seekers to spend more time finding resources themselves. The latter organizations lose the extra value librarians add to information through the exercise of their expertise in information management and navigation.[33] They also lower the productivity of the client or researcher who was diverted from their own area of specialization to do a librarian's work.[34]

Technology Navigators. To these traditional library services, technology has added the responsibility for providing access to electronic information and for introducing the public to new equipment and software. Libraries, for example, introduced many patrons to audio and visual equipment. Similarly, through online public access catalogs (OPACs), on which patrons electronically search bibliographic records of a library's holdings, and through databases of indexes and reference material, libraries of all types facilitate access to information and acquaint many users with computers and CD-ROMs.[35] Library media centers commonly integrate multimedia materials into programs in an effort to intrigue, as well as to educate, students.[36]

Anything that is new can be intimidating. If someone is comfortable with a card catalog, why switch to an OPAC? When librarians select and explain technology, they offer patrons the opportunity to experiment in a pressure-free situation, without anyone looking over their shoulder, and with the assurance of a librarian nearby to assist. For many, especially the users of public and school libraries, the experience is one of their first introductions to computers. It does not take long before the new technology does not feel new. Then, not only do library patrons of all ages grow accustomed to searching a database for books or articles, they clamor for more technology and faster tools.[37]

Benefits Derived from Libraries

Americans like libraries; more than 60% visit a public library at least once each year and 40% do so each month. More children participate in library summer reading programs than in Little League baseball. More than 14.2 million students, faculty, and members of the general public use college and university libraries each week. Special libraries save businesses, scientists, and engineers an estimated $19 billion a year in information resource costs.[38]

Yet, many of the benefits of libraries are taken for granted. The social utility of guaranteed free access to information, the time and money saved because someone else organized information, or the economic and personal advantages derived from libraries are not always appreciated.

Safety Net. Libraries have been described as information equalizers. By removing barriers to information resources and services faced by information "have nots" -- the economically disadvantaged, the undereducated, and/or rural populations -- libraries act as a social safety net.[39] With library access to information resources, school children more readily learn to read and write; adults can enhance their knowledge or research skills; college students are able to explore topics and learn how to work on their own; businesses, from microenterprises to corporate giants, can identify market niches and emerging trends; and citizens can be better informed and better able to participate in the democratic process. With access to librarians, constituents have another avenue for becoming information literate, learning how to find and to evaluate information. Knowing how to read is important, but the information safety net also includes the skills to critically assess sources so that users can capitalize on the access to information.[40]

Without the library safety net, the privileges of the affluent become that much more advantageous, and the disadvantages of the lower classes become that much harder to overcome. The gap between the haves and the have nots would be even wider and the promise of equal opportunity that much more elusive.

The safety net role is especially important in the high technology age. Already, affluent people have access to computers and the computer networks where an increasing amount of information flows. Meanwhile, many lower-income people lack the means or the skills to tap into those resources. If this trend continues, those who have access to computers and understand how to use them will be in a privileged position, while those who do not may become second-class citizens.[41] In their safety net role, libraries work to address this inequity.

Time and Money Saver. Library collections save users money by taking advantage of economies of scale. They do this by spreading over a number of users the large fixed costs associated with assembling library collections. As more people use the library, the unit cost of library services decreases, until the maximum feasible amount of service that the library is capable of providing is reached.[42] In other words, as long as the expense of getting to and using the library is low in terms of time and travel costs, it is cheaper to amass resources in one place than to buy many individual collections. In addition,

some library services -- answering reference questions, locating information, and managing information efficiently -- save users time, and to the extent that a patron's time is money, this also translates into cost savings from library use.

These savings are especially valuable during slow economic times when library use goes up. Job hunters visit library collections of employment journals, business directories, and books on interviewing and resume preparation. Libraries save these patrons the expense of buying the materials, and the time and effort of compiling good sources.[43] Even in prosperous times, libraries offer helpful job services. According to Management Review magazine, a common mistake made by new business owners is failing to do initial market research. Timothy Maurer, director of the Blue Chip Initiative, a program sponsored by Connecticut Mutual Life Insurance Company, recommends that prospective owners take advantage of library resources to find business information indicating whether the product or service is needed, who the competition is, and what assistance they will need.[44] The Austin Chamber of Commerce echoes this suggestion, advising new business owners to use the public library's business section, among other resources.[45] Similarly, sole proprietors and other cost-conscious business people save business expenses by relying on journals and reference materials in public or special libraries, instead of going to the time and expense of buying and organizing their own collections.[46]

Positive Externalities. Library benefits also extend to people who do not use them directly. Supplementing education, supporting an informed citizenry, creating a demand for products, and strengthening communities, effective library services benefit people who never set foot in a library. In economic terms, they confer positive externalities on non-library users.

Perhaps the most tangible externality is that library services create demand for goods in the private sector by introducing the public to books, magazines, and videos. People experiment with new authors, new journals, and new resources in libraries, especially in recessionary periods when they are reluctant to spend extra money. Then, those who find something they like, who want individual copies, or who want more convenient service, and can afford to pay for it, turn to private providers.[47]

Moreover, communities indirectly benefit from successful libraries in a variety of ways:

- By enhancing education, contributing to a skilled workforce, or supporting entrepreneurs, libraries make communities more economically competitive.
- By efficiently managing information resources, special and academic libraries make organizations more productive and innovative.
- By providing access to public information, libraries contribute to a more vibrant democratic process.[48]

Furthermore, community contentment should not be overlooked. Families that appreciate children's library sections, summer programs, interesting school library activities, and adult recreational and educational opportunities have more reason to enjoy where they live and to feel compelled to contribute to their community. At a time when access to information is priceless and when quality stimulation is in short supply, libraries conferring these positive externalities provide valuable and unique benefits to the community at large.

Libraries have a long and diverse history, full of lessons and insights. Through internal rivalries and external competition, the ups and downs of the funding and political cycles, and the changing needs of users, libraries have remained vital institutions. They have done that by responding to changing times, by offering essential services, and by quietly providing a long list of direct and indirect benefits. By building on this past, and updating it to fit into a technologically advanced society that emphasizes results, libraries will continue to serve as sources of civic pride and providers of valuable services.

Of course, they cannot do that alone. As predominantly public institutions, they require public support and funding. To resourcefully apply historical lessons, the library community -- including governing bodies and supporters -- should supplement an appreciation for libraries' traditional contributions with a vision of the long-term potential for library contributions in a technologically-advanced information society. Accordingly, as a complement to the summary of library history, an overview of the networked environment is provided in the next chapter.

CHAPTER 2

The Information Age

The Information Age undoubtedly is here. Since at least the 1960s, writers have been chronicling the rising prominence of information in the economy and in society overall.[49] conomic and technological advancements have made information an essential and ubiquitous commodity, and educational and technological advancements have made it an essential public resource. Maintaining the free flow of information is a worthwhile investment when it contributes to successful commercial ventures and to an improved standard of living. It becomes a priceless endeavor when it empowers people to fully participate in the democratic process, to join together in a common heritage or interest, or to aspire to a better life. Impacting virtually every aspect of life, information must be exploited and protected at the same time.

Discussions abound about how information should be accessed, regulated, and enjoyed in print and electronic forms. Libraries, of course, are implicated, if not always directly involved, in these discussions. Although information's function as a public resource, and hence libraries' role as a conduit to that resource, is not disregarded, it is information's function as an economic commodity that seems to attract attention and to bypass libraries. Yet, this economic function has broad implications for libraries, particularly in keeping with the traditional safety net role.

These discussions transcend state, and even national, borders. Every region, and every library, has to address the new order and prepare for the future. Texas and its libraries are no exception. Examining the context of the information economy and the proliferation of network and information technology, in conjunction with public efforts to enhance access to information, will assist decision

makers in evaluating libraries' present roles and in reconceptualizing long-range views of the library of the future.

The Information Economy

Shifts in the United States economy have contributed to information's transformation into a fundamental economic resource.[50] In 1950, a majority of workers performed manual labor, but since then, the number of people engaged in manual work has decreased significantly. According to Peter Drucker, in 1990, only 20% of the workforce performed manual work and by 2010, that level will fall to 10%.[51] Instead, today's workforce is dominated by knowledge and service workers whose jobs revolve around creating, manipulating, and processing information. The Clinton Administration estimates that the vast majority of jobs rely heavily on, if not directly use, information.[52] Michael Dertouzos, director of the Laboratory for Computer Science at the Massachusetts Institute of Technology, estimates that "80% of our $6 trillion gross national product is information-related."[53]

Technological change accelerated information's rise in importance as a commodity. First, manufacturing processes became more automated, forcing many industrial workers to find work in the service or knowledge sectors.[54] Second, the surge of recent technological applications changed the way information is created, manipulated, moved, and applied. With dta easier to generate, organizations feel a greater urgency to analyze, diagnose, and dispose of it to avoid drowning. Not surprisigly, then, there are more jobs focused on converting data into information. In this environment, access to good jobs increasingly requires a college degree, and literacy now includes basic computer skills and an understanding of technology.[55]

The need to be globaliy competitive and to achieve a solid return on investment represents a considerable incentive to make the most of the information economy. "Knowledge formation," consisting of formal education, continuing education, and research and development, is the largest investment in every developed country. By focusing on the relative gain that can be accomplished through the effective and continued use of information, organizations and individuals can achieve an "information edge" over competitors,

leading to improved productivity, a more competitive position, and a higher return on investment.[56]

Texas' Position

The Clinton Administration expects the technologies that create, manipulate, manage and use information to fuel economic growth which, in turn, will generate a steadily-increasing standard of living.[57] Texas government and industry are in a good position to fully realize these expectations. Due in part to a high birth rate and a large influx of people, along with economic diversification, Texas' economy has grown faster than the nation's throughout the past 20 years. Recently, it has emerged as a high-tech leader, establishing a large presence on the Internet and attracting many computer and telecommunications firms. Even Texas' manufacturing sector is embracing the technological age. While the state still produces substantial amounts of oil, electronic equipment and components comprise a larger exporting industry.[58]

In the future, however, Texas' economic growth, like the country's as a whole, will depend more on higher productivity than on a growing labor force.[59] With the shift to the information economy, the standard of living will not increase unless the low productivity of knowledge and service workers increases. Higher productivity in this area, then, is the economic challenge of the future on which the competitiveness of every country, every state, every industry, and every institution depends.[60] Increased productivity will require, among other things, the ability to apply the innovations that Texas' higher education system makes so available. In addition to providing access to college degrees, this ability also depends on providing a useful, lifelong education to students who do not finish college.[61]

Texas is responding to the demands of the high-tech information age. The State Strategic Plan for Telecommunications noted that Texas needs telecommunications infrastructure to attract high-wage, clean, service-producing industries, such as law and banking, and to offer rural areas economic opportunities to replace a declining manufacturing base. It recommended using video conferencing, electronic mail (E-mail), shared databases, interactive computing, and distance learning, to ensure not only a better quality education, but also a more equitable one. Furthermore, Texas' government has

recognized the need for state agencies to share electronic resources with the public, as well as with each other.[62] Achieving these goals requires a new definition of "infrastructure" that includes libraries, educational facilities, and community networks, as well as roads, bridges and utilities. As the Texas Performance Review noted, the new telecommunications technology only has unlimited potential if all Texans have equal opportunities to access it.[63] With this understanding, the goal is to use a telecommunications infrastructure as a catalyst for achieving the vision of an educated, healthy, economically sound Texas.[64]

Libraries' Position

Thus, while the emergence of the information economy presents challenges for libraries, it also relies on their continued success. Fortunately for libraries and society, they are experienced at operating in such an uncertain climate. Throughout their history, libraries have responded to changing needs and have provided essential economic and educational services. This time, the challenge for libraries is to respond quickly to the demands of information as a leading commodity and to the expanding penetration of computer networks, without abandoning educational, civic, and cultural pursuits. With foresight, innovations, and the requisite outside support, libraries can capitalize on contemporary opportunities, ensuring future access to quality information and encouraging future applications that generate knowledge, as well as entertainment and profit.

Networks

Interactive, interoperable, and interconnected computer networks will change forever the way information is created, applied, and communicated. They give any user access to global resources and audiences, and the power to collaborate with experts around the world, or with colleagues across town, without leaving the home or office. In this way, these networks foster creativity, specialization, and freedom from the limits of geographical boundaries. Additionally, in conjunction with the surge in personal computers, networks enhance individuals' ability to create and disseminate artistic expression, to pursue hobbies, and to debate issues. As it attracts more

people, networking will become "a powerful force for democracy, individuality, community, and high culture."[65]

Because networking is relatively new and has the potential to reach everyone, it affects the use of information as a private commodity and as a public resource. Commercial entities already are preparing to exploit the private commodity; the challenge is to ensure public access to information and to support non-profit applications that improve the quality of life.

Creating an environment with more substance, inspiration, and purposes than cable television or video games will not be easy. For one thing, connecting every building with the fiber optic cable necessary to transmit the full range of voice, sound, graphics, and text is expensive. Teaching everyone how to use the new technology may be even more daunting. Skills such as finding, accessing, critically assessing and applying information, problem solving, and computer navigation will be fundamental to personal and professional success.[66] However, with the education system already struggling to prepare students for the information economy, there is no guarantee that a goal of universal network literacy is attainable in the near future. Nevertheless, federal, state, and local programs are attempting to realize the potential of networks as incubators for artistic, intellectual, social, and commercial enrichment.

Network Technology Overview

Many organizations and campuses joined the computer networking movement by establishing local area networks (LANs) in which the local computers were connected to each other and/or to a nearby mainframe host computer. Among other things, LANs permit sharing of software and printers, access to the library's OPAC, and communication of information through E-mail. The amount of information that can be transmitted on the network depends on the bandwidth; the more bandwidth, the more types and amount of information that can be transmitted. In addition to connecting software applications, LANs can connect workstations with CD-ROMs so that multiple users have access to any given disk on the system.[67]

LANs also can be connected to outside computers, databases, and networks for additional connectivity. The interconnected networks are either LANs or wide area networks (WANs) in which computers separated by great distances are connected via telecommunications circuits similar to long-distance telephone circuits.[68] These networks are the much talked about information highway. Resources previously available only locally now are available to anyone with network connections.[69]

Despite the hype about access to the global village, geography still is not irrelevant. Like any major roadway, the information highway requires on and off ramps to move the information. The ramps are the "last mile" between the service provider and the end user.[70] Until recently, the ramps reached only endusers affiliated with universities, government agencies, and some industries. While the apparent goal of policy makers is to ensure construction of the last mile, it may take up to 20 years and $500 billion to do so.[71] For this reason, President Clinton and Vice President Gore set the oft-quoted goal of laying the foundation for a national information infrastructure by connecting every school, hospital, clinic, and library.

The advantage of a network of networks is that they are interoperable, as well as interconnected. Interoperability refers to the ability of equipment with different operating systems to exchange data with each other.[72] Users then have access to a wide range of resources and, typically, always want more. This is the attitude and the technology that has fostered the exponential growth of the Internet, the most famous network of networks.

The Internet

The Internet started as a U.S. Defense Department experiment to connect researchers' computers at different sites. This work enabled the computers to share data and the researchers to exchange E-mail.[73] The National Science Foundation (NSF) decided that this type of networking was a national scientific priority and took over the Defense Department's role. The NSF funded a telecommunications network, or "backbone", connecting regional sites and making this network of networks accessible to researchers and higher education institutions.[74] The gateways between the Internet and electronic mail

systems, computer bulletin board systems and commercial network services made the system accessible to a wide variety of users.[75]

As the Internet expanded to private use, online conferences and mailing lists relating to every subject imaginable developed. Starting with MELVYL, the University of California's online catalog, libraries participated in the early growth of the Internet by making their online catalogs available over the Internet.[76] As more people explored the Internet, more features that had little to do with university research emerged.

Throughout the 1990s, the Internet has grown at a tremendous rate. Although technological improvements were implemented to keep up with the increased traffic, no central computer runs the Internet. This diffuse system protects against the entire Internet shutting down and encourages an independent and democratic atmosphere. The proliferation and the autonomy of so many networks, however, hinders organization and navigation. To make the Internet more user-friendly, programmers and researchers are developing software and search tools. Besides E-mail, which most networks support, some popular Internet applications include:

- File Transfer Protocol (FTP): method for retrieving files from remote directories
- Telnet: remote access to computing resources
- Gopher: menu driven, and searchable directories and files
- World Wide Web: databases and directories linked by hypertext, a system in which words in one document are linked to other documents

With these tools, network navigators access sources from around the world, in essence exploring the rudimentary beginnings of the virtual library.

Today, the Internet is a national phenomenon. In addition to existing educational and research purposes, plans for entertainment and electronic commerce are taking root, now that the NSF is

preparing to turn the Internet over to private control.* This change should open the door to even more growth.

Concerns exist, however, about the next stage of Internet development. Currently, relatively few people have access to the Internet as most users are connected through their employer or school. Without this perk, an Internet connection can be expensive. Furthermore, in many places, the last mile to the Internet is not complete. This raises the specter of an even wider gap between the information haves with access to the Internet and the emerging information highway and the information have nots with little or no access.

Additionally, the introduction of commercialization may mean less protection for research and educational work.[77] Although the involvement of the private sector is inevitable and constructive, the potential of computer networks will be wasted if home shopping and video on demand become the signature applications. Or, in Senator Bob Kerrey's (D-NE) words, if we concede all guidance to the marketplace, "there will be little more than cerebral mush."[78]

The National Research and Education Network

The federal government lent its support to the educational component of networking with the passage of the High Performance Computing Act of 1991. The law provided for the linkage of research institutions, educational institutions, government, and industry in a National Research and Education Network (NREN). Federal agencies were instructed to work with private network providers, state and local agencies, libraries and others to ensure that all researchers, educators, and students, not just those affiliated with major universities, would have access to high performance computing systems and electronic information resources.[79] These anticipated resources ranged from desktop workstations capable of advanced scientific applications to a fully digitized Library of Congress collection, all accessible on NREN.[80]

* The NSF instituted an acceptable use policy restricting Internet use to research and educational purposes. Without NSF control, commercial activity will be permissible.

NREN grew out of the Internet's expanding presence throughout the education and research community. Federal funding was intended to inspire technology and products that would create a high technology network for the research and education community, increase the affordability of private sector involvement, and lay the groundwork for a national information infrastructure. Libraries would benefit to some extent from NREN funding, due to appropriations distributed through the NSF.[81] There were no plans, however, to use federal funds to even connect every academic library to the network. The federal Office of Science and Technology Policy viewed that as a local responsibility.[82]

The National Information Infrastructure

The ideals of the NREN have expanded beyond research and education to touch virtually every aspect of national life. The federal government now envisions a National Information Infrastructure (NII) that "can provide a seamless web of interconnected, interoperable information networks, computers, databases, and consumer electronics that will eventually link homes, workplaces, and public institutions together."[83]

According to the NII Agenda for Action, the national infrastructure will be available to all Americans to create jobs, spur growth, and foster U.S. technological leadership; to deliver higher-quality, lower-cost government services; to prepare children for the workplace of the 21st century; and to build a more open and participatory democracy at all levels of government.

Additionally, the NII agenda includes plans for expanding the High-Performance Computing and Communications Program, which funds research and development designed to create more powerful computers, faster computer networks, and more sophisticated software. The new component, called Information Infrastructure Technologies and Applications, will develop and apply high-performance computing and high-speed networking technologies for use in health care, education, libraries, manufacturing, and the provision of government information.[84]

Furthermore, the federal government plans to facilitate affordable access to the substance on the NII. Through Telecommunica-

tions and Information Infrastructure Assistance Program (TIIAP) matching grants, administered by the U.S. Department of Commerce's National Telecommunications Information Administration, the federal government is funding demonstration projects to help states, school districts, libraries and other non-profit organizations buy computers and connect to the Internet. (TSL is applying for TIIAP grants to connect public libraries in South Texas and San Antonio to the Internet.) The federal government also is working to assure public service access to advanced telecommunications systems through legal and regulatory reform.[85] Thus, even if the federal government still considers libraries a local responsibility, it is offering assistance, as it has done in the past, that libraries can use to start or expand programs and services, to demonstrate benefits, and to leverage state and local support.

Texas State Networks

Like the federal government, Texas' state government is laying the groundwork for statewide networking and access to public information. Many state agencies have started offering electronic access to information through gophers and World Wide Web home pages. The Texas Department of Commerce (TDOC), for one, started the Texas Open Network Enterprise (TEXAS-ONE), a system offering low-cost access to electronic information and services for Texas small businesses over the Internet. Over 90% of the services on TEXAS-ONE are free, but businesses have to establish their own Internet connection. Additionally, TDOC's bulletin board system (BBS) includes Texas legislation affecting businesses, economic development information, community profiles, and county demographics.

In a parallel effort, the Comptroller of Public Accounts administers the Window on State Government -- a BBS that provides access to economic and tax information, state spending and revenue data, and job openings. The Texas Legislative Council Information Systems division administers the Texas Legislative Gopher which includes text for all bills, capitol and district office information, calendars and session times, and general information about the legislative branch. It also gives the legislative community access to the Internet and pointers to relevant information. The Texas Employment Commis-

sion administers the Governor's Job Bank, a listing of job openings in state agencies, through its bulletin board.

The Texas Education Agency also joined the networking movement when it opened the Texas Education Network (TENET), one of the first networks in the country for elementary and secondary schools. TENET offers every school Internet access. Librarians, teachers, and administrators have access to E-mail, bulletin boards, computer conferencing, educational databases, and catalogs from libraries across Texas and around the world. The University of Texas at Austin administers TENET and provides the Internet connection on the Texas Higher Education Network. TENET Master Trainers, comprised of librarians, math supervisors, computer coordinators and representatives from around the state, provide training and workshops on using TENET.

Previously, these various state bulletin boards were uncoordinated, lacking connections and a single point of access. To remove some of the roadblocks, the Department of Information Resources established the Texas Information Highway on the Internet. The Texas Information Highway acts as a central gateway to the services offered by state agencies, universities, and public libraries. In addition to providing access to the state's information resources, it connects to library catalogs, federal government information, and government information from other states. Although the network is relatively low-tech, relying on existing copper wires instead of fiber optic lines, it provides Texans who have a computer and a modem with access to extensive information. Thanks to such efforts, Texas repeatedly is cited as being among the states that are leading in the development of the information highway.

Texas Library Projects

State programs also are in place furthering network access to and from libraries. By sharing resources and organizing information, three projects are expanding both the resources available on the information highway and public access to them.

Tex-Share. Tex-Share is a cooperative library resource sharing program, initially funded by the Texas legislature in the 1994-1995 biennium. Proposed by the Texas Council of State University Librari-

ans and administered by the Texas Higher Education Coordinating Board, Tex-Share promotes the sharing of library resources--books, journals, technical reports, government documents, electronic databases, and staff expertise--among all of the 52 publicly-funded university libraries in Texas. The goal of Tex-Share is to provide a student in Brownsville or Midland with access to the same resources as a student in Austin or College Station.

Emphasizing information access over ownership, Tex-Share attempts to capitalize on economies of scale and on the collective buying power of so many academic libraries. For example, by negotiating statewide contracts for indexes or electronic databases, Tex-Share will extend electronic information resources, now available only at a few institutions, to all public universities at far less cost than if each school contracted individually. To illustrate the potential benefits, Tex-Share already has negotiated a contract for the Federal Register to be available, and searchable, over the Internet. Normally, the service would cost $500 per school per year. By combining purchasing power, the service is available to every university, community college, and public school in Texas for a statewide total cost of $12,000 per year. Furthermore, every participating library received an Internet connection, Ariel software which provides document delivery over the Internet, and $3,000 towards the purchase of a workstation. Library representatives are finalizing agreements for a statewide library card that will allow students and faculty associated with a Tex-Share institution to use any Tex-Share library, and are working on standard interlibrary loan protocols that every member library will adopt.[86]

Tex-Share is based on the premise that, in addition to receiving benefits, all participating libraries contribute to the program. Each library provides users at other libraries access to its local online library catalog, to its general print collections and local and specialized collections via the standardized interlibrary loan protocols and Ariel, to electronic index and information databases available on computers on its campus, and to its staff resources and expertise.[87] In the short term, however, lack of funding places restrictions on the program's plans. Because of limited resources, for example, the program cannot afford to connect community colleges to the Internet. As a result, 27 Texas community colleges are competing for NSF grants to finance the connections independently. The hope is that as more academic libraries get connected, and demonstrate the benefits

of technology in libraries and of pooled resources, Tex-Share will be able to extend or link the program to interested community colleges, private academic libraries, public libraries, and library media centers willing to agree to the program requirements and to negotiated contracts.[88]

Texas State Electronic Library. The Texas State Library is promoting access to state information through the Texas State Electronic Library (TSEL), or Project Link, which is a statewide electronic network linking libraries to the TSL OPAC; many Texas public and academic library OPACs; Texas government gophers, reports and legislation; TEXAS-ONE; and other information. With this service, TSL offers public libraries a vehicle for exploring the Internet and Texas networks and, in the process, illustrates to financial supporters and to other libraries the benefits of such uses.

In addition, Senate Bill 366, TSL's 1995 Sunset legislation, requires the agency to develop and maintain an on-line index to all state information services and to ensure access to state publications in electronic formats. TSL also conducts workshops introducing Internet services to public librarians, attempts to demonstrate the benefits of library use of the Internet, and negotiates for statewide licenses for resources that public libraries then can access. However, the agency does not provide Internet connections. Public libraries incur no extra charges once they reach TSEL, but they have to establish their own Internet connection.[89]

Texas Library Connection. In 1993, to improve information skills and resources, the Texas legislature appropriated funds for the development of a statewide database of public school library media center holdings. TEA responded with the Texas Library Connection -- a system designed to provide access to a full-text periodical database and to a union catalog of all public school library holdings. Like Tex-Share and TSEL, the Texas Library Connection will utilize the Internet, via TENET, to link member libraries. TEA started pilot projects during the 1994-95 school year. The program is using national and international standards to keep open the possibility, as demands require and resources permit, of merging with TSL's and Tex-Share's databases.[90]

Community Networks

Local grassroots efforts also are organizing a framework for universal access to networks and information resources. Community or civic networks are starting and prospering throughout Texas and the country, offering local government institutions, social service agencies, and other community organizations, as well as individuals, the opportunity to connect to the Internet.

These networks, sometimes called Free-Nets,* provide local information and services over a computer network, usually with the goal of drawing as many people as possible into the computer age.[91] Services include E-mail, calendars of events, want ads, bus schedules, discussion forums, legislation and regulations, advice from professionals and trades people, and library online catalogs and reference services. Sponsors include universities, hospitals, local phone companies, non-profits, businesses, and individual volunteers. Sources of funding include grants from foundations, telecommunications and computer companies, local businesses, and state and local governments.[92]

Tom Grunder, founder of the Cleveland Free-Net, the first Free-Net, compares community networks to public libraries.

> Toward the end of the last century the public library as we know it today did not exist. Eventually, however,literacy became high enough (and the cost of books cheap enough) that the free public library became feasible. People in cities and towns all over the country got together to make free public access to the printed word a reality. The result was a legacy from which virtually everyone reading this document has, at one point or another, benefitted. We believe we have reached a point in this century where computer "literacy" has gotten high enough (and the cost of the equipment low enough) that a demand for free, public access, computerized information systems has developed.[93]

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* Free-nets are the name for community networks affiliated with the National Public Telecomputing Network, a PBS-style organization. They do not charge fees to members, though some other community networks do.

In line with this analogy, many libraries and librarians have participated in community networks. In Austin, for example, local librarians have played a leading role in forming the Metropolitan Austin Information Network. In El Paso, the Rio Grande Free-Net, the first Free-Net in Texas, simulates a multitype library, linking the OPACs of the El Paso Public Library, the El Paso Community College Library System, the El Paso Independent School District Library System, Tex-Share, and the Texas State Electronic Library. In general, libraries provide public terminals and modems for the networks (a necessity until low cost service to homes is widely available), make their catalogs available on the networks, and offer online reference assistance. As a result of this involvement -- which not only contributes to communities, but improves libraries' images in communities -- more than one-half of the states in 1994, with the help of federal money, were exploring ways of connecting local library systems to the Internet.[94]

In Sum

Understanding the context of the networked environment is important for understanding its potential. The technology is practical and flexible. Federal, state, local, and private participants appreciate and promote the resulting information applications. Consequently, libraries will be able to find many uses for the technology and to attract support for efforts to broaden services from print to electronic formats.

It is important that libraries have the motivation and the capability to take advantage of the new opportunities. Library services and librarians' expertise will be valuable ingredients in the development of an organized, accessible, educational, and enjoyable information highway. The key is for libraries and financial supporters to take a page out of history and cooperate to fill in the gaps left by the sweeping changes with enhanced traditional services and relevant new ones.

CHAPTER 3

Library Roles In The Information Age

Information's predominance in visions of the future, and the extent to which network technology and applications correspond with library goals and services, would seem to be a boon for libraries. Yet, depictions of libraries in the future often range from non-entities replaced by virtual reality to temporary stakeholders lending a hand during the transition from print to digital formats.[95] The problem is one of image and economics. While few disagree that libraries have been valuable institutions in the past, many wonder how necessary they will be in the future. Libraries sometimes are viewed as more of a repository than a resource, a luxury to be done without when costs must be cut. At the same time, shrinking budgets make it harder for libraries to contradict these perceptions. Many librarians face choosing between continuing traditional services at the same level and starting new services to keep up with public expectations.

The situation is not new. Libraries responded to a similar challenge mid-century and won a good deal of government support by cultivating allies and demonstrating the value of investing in libraries. The difference today is that the magnitude and rate of technological advancement add urgency to current efforts to redefine libraries. Libraries that fail to respond to the current challenge risk impending obsolescence. According to Charles McClure, a leading expert on libraries and networks,

> "it is unlikely that the library can continue to be all things to all people but will have to choose between what

it will do, and do well, and those activities and services it will have to discontinue."[96]

At the same time, funding bodies that fail to provide libraries with adequate resources risk impairing the institution's ability to continue providing economic and societal benefits to communities. When libraries make the hard choices, and display a willingness to apply lessons from their own history and traditions and to adopt practices from the business and political realms, governments should reciprocate with money and recognition. In the event of such interdisciplinary efforts and cooperation, libraries will be in a position to play many roles in the 21st century.

Provider of Universal Access to Electronic Information

Arguably, the most important role libraries should fill in the future is the age-old one of an information gateway. Society's reliance on information escalates the importance of that role. As things now stand, many people are at risk of becoming information have nots. Economically disadvantaged groups are unlikely to have network access through jobs or schools and cannot afford to pay for equipment and connection costs. With information infrastructure concentrated in urban areas, rural communities often lack local, and affordable, connections. Moreover, besides the inability to pay, the inability to use networks, to locate sources and to maneuver through databases and menus, will hinder access.[97] Individuals and groups dealing with these obstacles will miss educational, economic, and personal opportunities commonly available to more affluent or better-educated people. To avoid the disparity, people need access to personal computers and software, they need connections to electronic infrastructure such as the Internet, and they must be literate enough to master them.[98] Libraries are in a position to address all three needs while continuing to fulfill the safety net function.

The obvious roadblock is money. To bypass this obstacle, many librarians in focus groups and on Publib-Net (an Internet mailing list) advise libraries to establish some kind of connection to the Internet, no matter how limited, and to build from there. After learning how to use the Internet and accumulating success stories, librarians will

be in a better position to prove its value to the library and to secure additional support for initiating and maintaining network services.

In return, funding bodies should be receptive to library needs and efforts. Schools, communities, businesses, and organizations all benefit from the access that libraries provide to valuable and enjoyable information resources.* Society in general benefits from librarians' assistance, from a more literate and informed society, and from a more competitive workforce. Accordingly, these bodies should help libraries to broaden the safety net and to provide more access via increased funding.

Still, no matter how inventive a library gets, or how supportive funding bodies are, budget restrictions will impose constraints on librarians' options. Therefore, pursuing universal access begs the question, how much access is enough?

- Does every library have to own every major database or merely offer the ability to peruse it?
- Does "access" mean finding cites for information or actually retrieving full-text versions of the document?
- How much Internet access is sufficient?

Decision makers must consider these questions when analyzing how to make optimum use of the multitude of available information resources.

Access Versus Ownership

An important element of the access definition is the debate between offering access to information resources and owning the

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* According to studies conducted in Colorado and South Texas, the size of a library media center's staff and collection was a leading predictor of academic achievement. Similarly, another study found that public libraries are visited 5.6 times per user for educational purposes and 2.4 times per user for work-related purposes. Of the work-related visits, 40% of those users saved time or money. (Lance, Keith Curry, et.al. Colorado Department of Education "The Impact of School Library Media Centers on Academic Achievement.", September, 1992. Hall-Ellis, Sylvia D. and Mary Ann Berry, "The Impact of Library Resource Centers on Academic Achievement in Selected Public Schools in South Texas.", 1994.)

resources. In the past, the "just in case" ownership model of collection development prevailed in most libraries; "just in case" someone might need a certain resource, the library bought it. Shrinking budgets and expanding networks have devalued this approach. Instead of owning every journal or every database, many libraries are shifting to a "just in time" access model. These libraries strive for access to pooled resources that can be delivered promptly and in the process acquire only the information that patrons want. Instead of subscribing to a journal, and consequently accruing the expenses that accompany ownership of issues that may never be used, libraries join networks or use the Internet.[99] This is the philosophy behind Tex-Share and the Texas Library Connection. In the spirit of cooperation and pragmatism that inspired interlibrary loans and union catalogs, modern libraries that take advantage of computer networks and software offer their patrons access to more resources at less cost.

Document Delivery. Document delivery is the crucial step that equates access with ownership. There is little doubt that, as library patrons use more information technology in libraries, they will expect more full-text information delivery in print or digital form. Allowing users to explore the World Wide Web will be instructive up to a point, but of limited value in a library if there is no mechanism for retrieving interesting documents. Similarly, offering access to citation or abstract and index databases, which locate information about articles and books but provide no access to the items themselves, may be more frustrating than no access at all.[100] Since Internet tools are available to anyone with equipment and a connection, and commercial online databases are available to anyone willing to pay, providing cost-effective document delivery may be the kink in the access issue that distinguishes libraries that will be able to keep up with consumer demand from those that will be replaced by technology and by other information providers.

The Internet. In response to this concern, some libraries, especially academic and large public libraries, are establishing access to full-text information through the Internet. Tools, such as gophers, FTP, Telnet, and World Wide Web browsers, allow users to access a world of information and to retrieve it to their local machine. For a price, libraries can utilize software, such as Ariel, that sends scanned documents over the Internet right to the recipient's computer. These "tools lay the foundation for the virtual library --

seamless access to information resources regardless of geographic location."[101]

Again, the difficulty is deciding whether or when a wide range of Internet or comparable resources will be necessary to constitute "access", especially if adopting all of them means cutting other programs. The more electronic services a library offers, the more computers and memory it will need to supply. Also, offering an extensive list of services translates into that many more things the staff needs to learn and to explain to users. If a library staff is not already sophisticated about computers, this training aspect can involve significant expense. Public libraries, in particular, see this factor as a challenge. Along with Internet connection costs, they cite training as a key impediment to public library involvement with the Internet. Because of these barriers, many libraries, especially small or rural libraries, offer limited (or no) Internet access.[102]

Such an outcome amounts to wasted opportunity. Electronic access to information gives all libraries the potential to be world-class. The Internet, for example, offers school library programs access to a range of resources previously available only to colleges and universities. Similarly, it brings the resources of libraries in small or remote colleges up to par with those in large, well-endowed universities. The Internet and its progeny will enable public libraries equipped with information technology and information specialists to furnish a high-quality safety net to people who do not go to college or who lack training in the use of computers and networks.[103] In the long run, capitalizing on these opportunities is essential if Texas is to begin the 21st century with a well-trained, competitive, and informed population.

In that spirit, some states have initiated programs to help libraries extend access to electronic information. Maryland's state library agency, for example, is providing Internet access to every resident through its *Sailor* Gopher. Most public, and many academic, libraries will offer public access terminals, and many library media centers will have dial-up access. Additionally, Maryland residents will be able to dial-in from home through a public library or an 800 number. As a result, everyone in the state can explore the Internet without charge, although users must pay for FTP, Telnet, and E-mail capability. A less comprehensive and less expensive state library alternative was established by the Kansas legislature. The *Informa-*

tion Network of Kansas provides online access to state government information and Kansas library catalogs, as well as full Internet access, to all Kansas libraries for $180, and to the public for $50, per year.

Although Tex-Share ensures that academic libraries in Texas' public colleges and universities have Internet access, and TENET and the Texas Library Connection have initiated some online access for library media centers, there is no organized statewide effort to provide access to public libraries in Texas as yet. Some public libraries have used state funds to establish a connection through the Library Systems. By 1997, three systems -- the Trans Pecos, the Alamo Area, and the Houston Area Library Systems -- will provide Internet access to all of their members, and two systems -- the South Texas and the North East Texas Library System -- will provide access to some members.[104] The Big Country Library System plans to offer at least E-mail to all members. Additionally, urban libraries, as in Fort Worth and Irving, have used money from Major Urban Resource Library (MURL) grants* to pay for telecommunication equipment.[105] These efforts are steps in the right direction, but they still leave it up to many individual libraries to allocate resources in such a way as to fund their own connections. Libraries such as those in Garland, Bay City, and McAllen have done just that. However, the majority of public libraries still do not have connections, and many that have connections do not offer public access. This is one area where Texas lags behind in the competition for advanced technology primacy. Governments and libraries need to work together to ensure that all libraries, and especially those with an educational component, are equipped to provide quality access to electronic information.

Information Literacy

Given the vast amount of information available, the ever increasing gateways to resources, and the lack of central coordination, it is understandable that libraries and policy makers are still

* MURL grants allocate funding to the 18 largest city libraries in Texas for providing some library services, such as network access to their OPAC, to people who live outside their boundaries.

defining electronic access and determining how to achieve it. Using information literacy as a framework may focus these efforts. Just as the need to bolster literacy, education, and job skills guided past library practices regarding access to print resources, the need to bolster lifelong education can guide future practices regarding digital resources.

Due to the sheer volume of information available, simply having access to a computer and a modem does not constitute functional access to electronic information. To serve as a useful gateway, libraries collectively will have to assist patrons in learning what information may exist, how to find it, and what to do with it. These skills are important not just for completing an isolated term paper, they are necessary preparation for the information-based economy and for a healthy democracy.[106]

To an extent, traditional outlets such as schools, jobs, experience, and reference librarians still teach what information exists. The explosion of technology, however, makes finding information -- both identifying and locating it -- more challenging and more imperative. As a result, librarians must have the incentive and the ability to obtain as much access to network information as is feasible. If librarians cannot explore the Internet, they will not know what is available. If libraries cannot offer Internet access, they will deny patrons a valuable educational opportunity. A school library that offers Boolean searching, printing of citations, and full-text database searching is preparing students more thoroughly than one that requires students to manually search printed sources, copy citations, and find articles on microfilm.[107] Likewise, the public or academic library that offers gopher and World Wide Web search tools, full-text downloading, and public access terminals linked to the local community network provides a much larger safety net than the library that offers read-only access to a few gopher menus.

Much of the third step, determining how to use the information, is up to the individual. However, the volume of information again highlights the value of librarians. The ease with which digital documents can be created, modified, and disseminated will complicate assessment of its reliability. To address this concern, librarians employ a contemporary corollary to the traditional reference librarians who always cited a source in answers. By using specialized knowledge to put information in context, librarians enhance "docu-

ment delivery," thereby distinguishing themselves from other information providers.[108]

Without library services, many people's access to constructive information will be illusionary. Not only will "have nots" have more trouble affording equipment and subscriptions to services, but many will lack the educational background needed to use the network and to critically assess the information they receive.[109] If this happens, libraries will be providing a smaller safety net, and the public will face the consequences of an undereducated, underinformed society trying to function in the information age. To avoid the losses associated with demotion to an auxiliary role, each library must have a realistic and efficient plan for providing sufficient equitable access and the resources to execute it. In many instances, this means that governments will need to play a major role in providing the needed resources.

The Virtual Library

If, through individual or collective efforts, every library in Texas offered full Internet access, the state would be significantly closer to achieving universal access. A concern is that achieving the goal ultimately will lead to the elimination of libraries as physical places. If most retrospective documents are converted to digital formats, all new documents are created digitally, and everyone has access to the NII, people will become accustomed to dialing into virtual or digital libraries with information delivery features.[110]

In the current turbulent climate, it is imprudent to predict if, or when, this outcome is likely. What is likely is that technology, as it has done in the past, will replace some services and jobs. Librarians should not necessarily fear this transition as their jobs entail far more than warehousing books. By considering all possible scenarios, including the development of virtual libraries, libraries will be better prepared to take advantage of computers and telecommunications innovations and to implement valuable services. With planning and ingenuity, the emergence of virtual libraries can turn into an opportunity for new and expanded roles and support for librarians.

The Virtual Road

A full-fledged virtual library is not close to fruition. The telecommunications infrastructure is not in place, and the majority of people do not own the equipment necessary to personally access electronic information. Some libraries do not even have all of their bibliographic cites converted to machine-readable records, never mind full-text in an electronic format, and relatively few users are sophisticated enough to take advantage of a virtual library.[111] Few, if any, entities -- public or private -- have the resources and expertise to provide total, affordable electronic access. Such a system requires extensive memory storage and telephone lines. Even if the entity outsources the electronic document delivery, a large delivery would overwhelm a solitary fax machine or receiving computer.[112]

Nevertheless, a lot of public and private information is accessible online, and people expect libraries to have started down the virtual road. Many libraries already have responded to the demand for electronic information by creating or joining networks and by sharing resources. Networks permit remote or local users to search online catalogs and databases, request materials, and await document delivery via fax or computer networks. They allow libraries to link staff for expanded and specialized electronic reference services and to link to library and non-library sources of information.[113] Along with Internet access, library networking lays the foundation for the virtual library.

But complications remain. For one thing, the Internet is a case study in disorganization. For example, users typically access remote libraries on the Internet with Telnet software, which gets the user to the new site but does not navigate through it. Without any governing guidelines, every site may use different commands, creating road blocks for inexperienced network navigators. On the other hand, organized networks and databases often are expensive, and copyright and pricing issues still must be worked out with publishers before general use is viable.[114]

Furthermore, when anyone can dial-in to various libraries, geographic restrictions disappear. This situation raises questions regarding how virtual libraries will be funded. With less uniquely local benefits, and quite expensive technology to buy and operate, decision makers will have to devise new forms of funding.

Thus, only a semblance of a virtual library is now in place. Librarians still have time to master the technology and to guide the development of virtual libraries so that traditional library purposes, such as facilitating access and information navigation, are not overlooked.

Virtual Benefits

The creation of virtual libraries means new benefits from library services and new reasons to use and support libraries. For example, academic librarians can recommend digitizing the most expensive and popular core academic journals as an efficiency measure. Many of these journals are very expensive in print form anyway, forcing some academic libraries to consider canceling journals that students and faculty need. Faculty already have started asking universities to consider diverting some library funding to individual departments for the purchase of relevant online database services. If a network of electronic journals proves cheaper, libraries will be able to offer more resources to students, including those taking classes through distance learning, and maintain a pivotal role as a campus information provider.[115] By devising multiple strategies of resource sharing and service provision to embrace the coming of the virtual library, libraries will be more competitive in the networked environment where librarians are not the only information intermediaries, and will be better prepared to justify future funding levels in a rapidly changing environment.

Gateway to Information Resources. Digitizing high-use material reinforces the public need for libraries. Especially during the current stage, when people do not have dial-in access to all information, libraries can establish themselves in patrons' minds as the gateway to resources. That way, even if all school children grow accustomed to accessing the Internet from their desks, when the time comes for them to seek assistance in using new tools or in finding particular information, they will think of libraries as the logical option.TSL's Texas State Electronic Library and other state agency gophers already have initiated this process, giving Texas libraries a practical starting point for introducing virtual resources and a virtual information model to follow.

Furthermore, since it is more expensive for every individual, company, or institution to buy their own "set" of all electronic information, libraries will play a pivotal role in marshalling community resources to provide services and as much information as possible to the public.[116] The economies of scale are even greater with electronic collections than with print collections. Without remote access, many companies that are too small to support an in-house library buy journals and reference materials because that is cheaper than taking the time to visit an outside library.[117] With remote access, and a well-organized virtual library, employees in these companies could conveniently use the library's resources.

Navigating Technology. Moreover, librarians, as well as patrons, benefit from access to technology. For example, librarians use E-mail to communicate with colleagues and customers. Their participation in listservs and other electronic forums facilitates information exchanges among librarians from all over the world, helping them to monitor advances and issues without having to attend expensive conferences or to subscribe to multiple professional journals.[118] Thus, in the long-run, funding that furthers these activities may free up revenue for other purposes.

Maneuvering through the expanding mass of virtual information requires vital information navigational skills. Improved network organization will make individual use easier, but efficiency, convenience, and necessity will ensure demand for information professionals long into the future. Already, virtual reference librarians are able to assist patrons seeking information about anything from car repairs to ethnic cooking to Ancient Greece by posting questions on a Usenet group or listserv devoted to the subject. Today's computer-savvy librarians also further independent navigation by maintaining library catalogs and local databases that are available over networks; by creating and moderating subject-oriented discussion groups of interest to their patrons; and by creating gopher menus and World Wide Web home pages that offer logical, well-organized, menu-driven access to services and resources on the Internet.[119] As more information comes online, the expertise of virtual reference librarians, like reference services for print materials, will be valuable in expediting patrons' search for answers.

Community Memory. Libraries' role as the keeper of community memory also fits into the virtual approach. In addition to

archiving print copies of documents, libraries can take the lead in preserving old documents by digitizing them. Less use and proper storage protect fragile paper documents without resorting to awkward microfilm or restrictions on use.[120]

In Sum

The shift toward digital libraries does not have to mean the marginalization of physical libraries or librarians. Instead, it represents one more change, albeit a dramatic one, in the history of library service. It presents another opportunity for libraries to act as gatekeepers to information resources and as stimuli to culture, innovation, and self-development. Digital libraries, through automation and networking, should increase access to information and therefore increase the public's need for library services. Adding order to the chaos of the Internet and supplementing location of information with delivery are perfect examples of the kind of value that needs to be added to electronic information. By exerting authority as professional organizers of up-to-date information in the formation of digital libraries, as well as champions for information have nots, librarians will ensure that libraries are key players in the evolving national networked information society.

Entrepreneurial Information Provider

It is often said that the only thing certain these days is change. For libraries, future change carries the possibility of marginalization because of new competition, new technology, and lack of resources.[121] The Internet is attracting legions of information providers who want to establish their wares in the virtual information marketplace. State agencies are creating their own gopher sites for public use. City governments are creating World Wide Web home pages publicizing city events and services. Community networks are mimicking electronic towns, offering access to a broad range of information resources and outlets. Increasingly, commercial services are attracting customers who want to explore the information highway and to participate in electronic forums from the comfort of home. Often, library catalogs or databases are included in these efforts, but

technology eventually will facilitate direct public access, decreasing the need for traditional library intermediaries.

In this competitive environment, libraries must "reinvent" themselves, as many arms of government are doing. In this endeavor, they must be flexible, innovative, and service-oriented. More to the point, they must realize that libraries will receive adequate funding only if a sufficient number of people use and support them, but, as people become more self-sufficient network navigators, they will use the library only if that is easier than finding information themselves.[122] Therefore, to improve their image as vibrant organizations with a future, libraries need to attract patrons, and the resultant political and institutional support, by offering and marketing a unique, appealing product.[123] To succeed, libraries must fill the role of the entrepreneurial information provider.

Adopting entrepreneurial tactics, such as rethinking missions and researching consumer preferences, does not mean that every library has to turn into a commercial enterprise, nor does it mean that libraries have to set out to run the "competition" out of business. Instead, adopting entrepreneurial tactics should be a means for dealing with rapid change. It should be a strategy for improving the operations of the library and for determining how to allocate resources. In this role, while networked technology and applications are still new, libraries will carve out a niche that efficiently and effectively serves constituents and complements other public service providers.

Entrepreneurial Spirit

"Reinvention," currently a common political buzzword, symbolizes the widespread realization that the typical modus operandi of public and private bureaucratic institutions, including libraries, inhibits innovation. Too often, their idea of improvement is to do the same things better. For libraries operating in a dynamic technological environment, this method produces slow change that risks being too little, too late.

Overcoming Bureaucracy. There are structural reasons for libraries' restraint. First, most libraries operate on a budget. Services are framed by estimates or caps in the budget instead of by

consumer demand. Success is measured by larger budgets instead of efficient results. Accordingly, there is less incentive to reduce costs or to risk implementing an untried idea. Second, libraries depend on constituents, not market share. As a result, libraries try to please everyone. Once again, this approach does not encourage least cost or efficient service provision. Moreover, taxpayers and policy makers are only going to be satisfied if libraries are providing necessary services.[124] Librarians can no longer assume that traditional services are all still necessary.

An entrepreneurial spirit will not change the budget or eliminate the broad responsibilities most libraries bear, but it will shift emphasis away from merely surviving and toward thriving through the provision of meaningful, quality service. When backed by library directors and financial supporters, it creates an environment conducive to questioning every expenditure and considering every proposal. As such, it is indispensable in overcoming bureaucratic intransigence.

Outreach. To start, entrepreneurial librarians must conduct the library equivalent of market research. By gathering information about what the population wants, including current non-library users, and comparing that with what libraries are capable of offering, libraries can make informed decisions about reallocating resources and taking strategic risks. In this respect, libraries can learn from the best of the community networks. By reaching out into the community, via forums such as meetings, workshops, and electronic suggestion boxes, these networks learn how to become relevant to the day-to-day lives of local users.[125] Similarly, libraries will learn how to distinguish themselves from their competitors by developing a comprehensive understanding of the information needs of their communities, be they cities, towns, schools, universities, businesses, or non-profit organizations. This process requires librarians to ask businesspeople directly what services they need, to ask government leaders what information they need, to ask students what tools are most helpful, etc. Apprised of constituent needs, library capabilities, and the availability of alternative resources, librarians then can decide how to optimize resources to convert vast amounts of unfiltered information into locally relevant services.

Responsiveness. Once a service is introduced, the entrepreneurial spirit encourages librarians to communicate regularly with patrons to receive feedback. If new technology requires librari-

ans to mediate access to networked information, librarians acquire the skills and offer the services that help patrons to locate and interpret resources.[126] If one service does not work or goes unused, libraries remain flexible enough to adopt new services. The combination of experimentation and responsiveness will lay the foundation for library success stories. Thus, while the entrepreneurial environment encourages some risk-taking, it also encourages informed decisions in which risks are minimized, opportunities are seized, and libraries become directly accountable to constituents.

Accountability

Accountability is the quid pro quo of the flexibility inherent in the entrepreneurial approach. It also functions as a reminder that libraries exist to serve their respective constituencies. Therefore, to demonstrate accountability, librarians should measure the outcomes that result from using library services -- such as time saved, products developed, businesses started, skills acquired, etc. -- not just what kind of information is available or how many people walk in the door. In other words, the focus of these efforts should be on the patron's gain. For example, qualitatively evaluating not just what library services were used, but what information needs were met will keep libraries informed about where they are succeeding and where they can improve.[127] Measurement of inputs has its place, but in the face of stiff competition for declining tax support, it does not carry the weight of evidence demonstrating efficiency and effectiveness.[128]

An important aspect of accountability is selling the value of the library to constituents. Librarians have to be assertive in reaching out to constituents, informing them about new services, and asking for their support in return. If a library develops programs that complement school curriculums, government agencies, or local businesses, they cannot sit back and hope the intended recipients discover the programs on their own.[129] Librarians have to publicize the services and demonstrate the benefits of collaboration. They need to inform constituents not just how many computers or databases are available, but how time can be saved by taking advantage of the services that information professionals offer.[130] This goal is especially important for library media centers because

their unique contributions to academic achievement often get overlooked in the labyrinth of educational reform and school funding.[131] In turn, when programs become popular, librarians should not hesitate to ask users to help libraries continue the services. There are many things supporters can do, from communicating with library funding bodies, to contributing time, money, or equipment, to starting or joining a Friends of the Library group.* When libraries can measure tangible outcomes, such as a certain number of people using the Internet, then funding bodies can see demonstrated public support for the outcomes, and libraries do not have to moralize in the abstract about the good that they do. They can point to concrete examples to leverage more funding.[132]

Leadership. Responsiveness and accountability should be viewed as methods and reasons for exercising leadership. While libraries should tailor services to satisfy those who use and pay for them, they also should continue their tradition of introducing new products and services, thereby educating patrons, shaping demand, and generally conferring positive externalities on the larger society. Thus, even if the patrons of a public library are not clamoring for networks, an entrepreneurial library is justified in finding a way to introduce new technology; waiting for someone else to do it for them is likely to be fruitless. By striving to be the expert in information and information technology, libraries will provide proactive services that anticipate needs and garner support.[133]

Entrepreneurial thinking does not mean abandoning the library's mission; it means determining how the library can most effectively serve and then efficiently carrying out that mission. The approach is not that different from some libraries' operations and most libraries' intentions. But it is more bottom line oriented, befitting a field representing a resource, not a luxury. To work effectively, of course, librarians' training should include some business training. Continuing education or Masters of Library Science classes or seminars should include topics such as management, finance, marketing, and grant writing.

* Supporters of the San Antonio Public Library went so far as to start a Foundation, in addition to the existing Friends group, to raise money and attract publicity.

With proper training and initiative, an entrepreneurial spirit can help libraries find a way to independently start or expand network access, and can inspire additional state and local financial support; it can influence library networks to find a way to deliver more resources for less money; and it can provide librarians with the tools for designing programs that add value to virtual libraries and invigorate libraries' images. Regardless of the goals, by using competition as a catalyst for resourceful management and improved services, libraries will be better prepared to fully participate in the electronic information movement and to contribute to their communities.

All Purpose Collaborator

If competition is the incentive for providing more relevant service, collaboration is the way to become more relevant to the community. Entrepreneurial is the way to think and manage; cooperative is the way to act. The metaphor of the information highway refers to an information explosion. There is plenty of work to go around and many different roles to play. By collaborating with public and private information providers, and by starting now before the roles are set in stone, libraries can optimize their resources and become indispensable information providers. Whether their work leads to a more organized Internet, wider access to electronic information, more productive use of information, a more educated and competitive workforce, or simply more enjoyment of the new technology, libraries that act as adjuncts to many segments of society, while also maintaining their own independent contribution, will be a valuable resource.

Each library's impact will depend on the abilities of the librarians who staff them. Librarians are the information professionals and service providers who add value to information. In the information society, these skills will be in high demand. The Information Infrastructure Task Force described librarians as managers of knowledge and information whose skills will be involved in all facets of the information chain.

> Librarians may be present at the information generation process; they will help manage digital materials and assist people in dealing with the plethora of information. Librarians will increasingly function as facilitators, en-

ablers, and teachers of network uses; library systems and consortia will negotiate information access rights on behalf of public users of the digital library. Librarians will become guides to network tools in much the same way as they have acted as guides to the use of traditional materials.[134]

Applying these skills in a collaborative context will assist libraries in increasing their visibility in, and their value to, communities, making them deserving of increased funding and the opportunity to be appreciated as information resources.[135]

Coordinate Information Services

There are plenty of services for libraries to provide in the initial stage of networked information that utilize the library traditions of adding value to information, ensuring an information safety net, and acting as a community resource. With the plethora of information being produced, libraries already have started by coordinating some of the efforts so that information is organized, accessible, and affordable.

Government Information. Increasingly, libraries work with government agencies to ensure easy access to electronic public information. By using their training to organize electronic access to legislation, analysis, statistics, and regulations, libraries help citizens stay informed about issues and obligations. TSL is performing this duty at the state level through the Texas State Electronic Library. Recognizing the importance of the function, TSL's 1995 Sunset legislation will authorizes the agency to provide access to all state publications available on line or in any electronic format. Libraries at other levels contribute with features such as public access terminals in the library, electronic distribution of forms, or E-mail to elected officials. In this way, libraries encourage responsible citizenship, democratic participation, and user-friendly government services -- attributes that both government officials and general citizens should appreciate.

Community Information. All types of libraries can fill the same role with general community information, especially if they work with community networks. As local information providers,

libraries and community networks are obvious partners. The skills that library staffs possess in using information resources give libraries an advantage over other locations for community network terminals. It simply makes sense for libraries to have the resources to help people learn how to use networks, whether it is through one-on-one training, manuals, or technical assistance.[136] By becoming involved in community networks, libraries influence their development and enhance their own services and stature. Community networks and libraries mutually benefit from collaboration instead of competing for the same resources and users.[137]

With or without community networks, libraries should expand their efforts to reach out to the private and non-profit sectors. For instance, libraries should demonstrate to area businesses and organizations the convenience of using library-created databases with information about local markets, local government, legislation, taxes, census data, and other topics. They should inform government leaders about available information that is relevant to their responsibilities. In return, satisfied businesses, organizations, administrators, and elected officials then should contribute money or volunteers to help keep the databases and other services current. Similarly, library media specialists need to work with teachers to find ways to integrate information problem-solving skills into the curriculum.[138] These libraries then can point to a tangible example of how they contribute to a well-trained workforce when seeking outside support for new technology and training. Publicizing the teamwork sets an example for community cooperation and encourages additional support for the library.

Economic Resource

High technology and user-friendly libraries also function as an economic resource by helping their localities to achieve a comparative advantage in technological proficiency and access. In today's knowledge-based, global economy, the quality of information infrastructure will help to determine where companies invest. States and regions increasingly recognize that development of their information infrastructure is the key to creating jobs and attracting new businesses.[139] When libraries have Internet connections, visitors see the signs of solid information infrastructure. They see communities and regions

laying the ground work for markets and employees that are open to networks and other information technology.

Furthermore, working with local government and businesses, entrepreneurial libraries can devise electronic services -- such as online collections devoted to the needs of start-up businesses or rural access to the latest medical or scientific research -- that make the area more attractive to perspective employers and employees and that appeal to a cross-section of industries, businesses, and individuals.[140] Such services combine traditional library skills with new technology to foster economic growth, demand for products, and a better quality of life.

Outsourcing. In the information economy, commercial information providers are responding to demand. Lexis and CompuServe, for instance, are attracting business customers with the wealth of online, up-to-date information they can provide.[141] Although these customers then have ample information at their fingertips, they also often wind up spending more time looking for information than using it.[142] People unskilled in information management waste time sorting through irrelevant data, which takes away from productive time spent converting relevant data into applied information.[143] In response, many organizations are attempting to cut costs and to improve efficiency by outsourcing responsibilities such as information location.

In the future, libraries that are comfortable using entrepreneurial skills may benefit from this trend. Some special libraries already contract to perform information services for clients, but more general purpose libraries also can incorporate the practice into their services. For example, if a public library cultivates specialized resources and staff in a field, the library should inform relevant practitioners and learn what services the practitioners would use.[144] With the accountability goal of replenishing local resources, as well as consuming them, libraries can convince practitioners to turn to librarians to locate and filter information. The practitioners then are free to concentrate on using their specialized knowledge more efficiently in the application of information. In the words of Michael Dertouzos, director of the Laboratory for Computer Science at MIT, practitioners can stop resorting to shovels to dig through all the information sent their way and instead rely on libraries to be "information bulldozers".[145] Ideally, productivity then increases, leaving everyone better off.

Funding Support. Many of these examples translate into more work for already overworked librarians. However, they also translate into more funding opportunities. When libraries collaborate with different entities, those entities acquire a vested interest in the libraries' success. A well-funded, well-functioning library is more help than a library paralyzed by lack of resources. While libraries can fight paralysis with entrepreneurial thinking, it is essential to have allies willing to support their funding needs. Local governments relying on libraries in an economic development plan are better served if libraries have the resources to keep staff trained and services flourishing. If a library's work attracts private donations and support, the local government should be even more inclined to adequately fund the library to keep local taxpayers and voters happy.[146]

In addition to making libraries indispensable to the community, intertwining with many segments of the community keeps libraries well versed in community needs and desires. As a result, these relationships will reduce the effort required to remain responsive and accountable. Staying informed, and applying the information wisely, will help the library to remain visible and deserving of continued community support.

Advisor for Information Policies

The very ambiguity that raises questions about the future of libraries offers another collaborative opportunity. With so many new concepts, applications, and markets, policy makers must update the legal and regulatory system affecting networks and information. As long-time information providers, librarians are experienced administrators of information policies. They know what happens without a safety net, without censorship or privacy protection, or without respect for diverse cultures or opinions. They know what works to ensure access and to balance First Amendment rights with community standards. Working with all levels of government, with the private sector, and with each other, librarians can use this experience to influence the development and implementation of laws and regulations affecting information infrastructure and use.

Copyright

Printed materials were relatively convenient to copyright. The materials themselves are burdensome to manufacture in any quantity and consist of tangible surfaces for attaching permanent copyright notices. Electronic sources are not so easily regulated. At a time when information is increasingly traded as a commodity, the intangible and modifiable forms in which it is conveyed present challenges for documenting transactions and preventing illicit reproductions.[147] Until intellectual property issues are updated, it is unlikely that electronic documents will be published on a large scale. Copyright law inevitably will be revised to address electronic formats.

As ubiquitous information providers, libraries offer a wealth of experience to assist groups reforming copyright laws so that the virtual marketplace can begin to prosper. Given their mission as generally non-commercial information providers and their experience with electronic information, librarians understand both the value and the obstacles of adapting some form of the first sale doctrine* to digital formats. The institution would not have prevailed if laws had required libraries or patrons to pay each time a material was lent, nor would it have thrived if writers and publishers had had no financial incentive for initially disseminating print information. As the focus changes from the sale of copies to the number of uses, librarians' perspective about electronic applications will be illustrative. For example, explaining the application of, and the demand for, document delivery services, and how technology impacts compliance, will highlight issues intellectual property reformers should address in the digital age.

By joining public and private leaders in copyright debates, libraries not only augment the intellectual process that will culminate in new laws, they fulfill the obligation to ensure access to information. They act as advocates for the public interest of library patrons. Using their social position and negotiating leverage as large consumers of

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* Under the first sale doctrine, the copyright owner has exclusive distribution rights until the object is sold. After the book, video, etc. is sold, the original owner's rights are exhausted and the new owner, such as a library, is free to treat the object as its own.

electronic information, they can contribute to fair laws that prevent digital resources from becoming prohibitively expensive. Policy makers should consider libraries' long years of success which demonstrate the wisdom of copyright law's goal of achieving a balance between the social values of universal access and information literacy and the economic pursuits of commercial publishers and intellectual property creators.[148]

Censorship

As with property rights, the intangible and easily transportable quality of electronic information on networks presents new issues regarding privacy, obscenity, and freedom of expression. If everyone has the right to connect to the NII, and everyone has the right to put information on the system, then in all likelihood, there is going to be unpleasant material such as child pornography and hate messages. Conversely, the potential also exists for "vigilante censorship" in which someone releases a computer virus that deletes words or images they do not like.[149]

Given the potential for every home and business to be connected to the network, the challenge of sorting out censorship policies is immense. However, libraries, especially public libraries, have addressed censorship issues with every information format they use. Their policies regarding censorship have been in place for a long time. This history gives libraries an advantage over other information providers dealing with this problem for the first time.[150] Therefore, libraries have an interest and an obligation to work with legal experts and community leaders to develop acceptable safeguards.

Infrastructure

Libraries span the continuum of network access, from barely a personal computer in the facility to full Internet access and networks of locally mounted databases. Accordingly, they should understand the problems resulting from lack of infrastructure and the promise of full library participation in the NII. Library of Congress ventures illustrate the point. The Library already has placed federal government information online in its Marvel Gopher, and plans to convert the most important materials in the nation's library collec-

tions into digital form. The goal is to contribute significantly to the substance available on the NII and to set a standard for technologies and policies that all virtual libraries eventually will follow.[151] The irony is that many people who lack the equipment necessary to access these digital resources cannot simply go to their local library to connect to their national library because many local libraries also lack the equipment.

Exemplifying technological wealth and poverty, libraries have much to contribute to the evolution of the NII.

- Joining with other educational institutions, they can make the equity case to legislative bodies and telecommunications companies for subsidizing initial library and school connections to the NII and for guaranteeing fair utility rates.

- Joining with community leaders, they can make the economic development case to taxpayers or governments about the value of investing in local infrastructure.[152]

- Joining with other public service information providers, such as community networks and schools, they can make the foresighted case for appealing to educational, cultural, and civic impulses in the construction of the NII's substantive content.

As with all collaborations, if they are successful in translating their varied experiences into persuasive insights that influence the formation of information policies, libraries will benefit -- in this case by the adoption of laws and regulations that are conducive to library growth and by the respect that should accompany their input. By cooperating with other libraries, other departments in an organization, and public and private entities, libraries position themselves to maximize influence within their regions and to become essential players in the shift to electronic information.[153]

In Sum

There are a variety of strategies that librarians can pursue to prepare libraries to be integral parts of the electronic information infrastructure. Each can decide which are appropriate to their own situation. The point is to start planning now for a high-tech future of widespread reliance on and access to information resources, of fewer physical limitations on the creation and dissemination of materials, and of rapidly changing needs and applications.

However, preparing for this future will cost money. Most Texas libraries will not be able to provide adequate, never mind exemplary, digital information services under existing funding levels. As a result, for any strategy to be successful in achieving fundamental goals, librarians will need to stretch dollars and to find additional funding sources, and existing funding sources will need to recognize the importance of giving libraries enough money to meet society's information needs.

CHAPTER 4

Funding

The changing technology and the expense of information services create new question marks about library funding. The costs of operating a library are increasing, particularly due to higher prices for books and serials, to significant increases in the quantity and variety of information available, and to changing infrastructure requirements. Meanwhile, libraries are competing for scarce public resources with entities such as prisons, and for strained private resources with priorities such as health care. Consequently, libraries are hard pressed to provide traditional services effectively, much less to add new services.[154] Two conditions are necessary to relieve the pressure: more funding from libraries' governing bodies and more assertiveness and receptiveness from libraries toward independent funding sources.

Public Funding

Despite Texas' emergence as a high technology leader, and the state's support of programs such as Tex-Share, the Texas State Electronic Library, and the Texas Library Connection, state and local government generally allocate less funding to libraries than do other states. As a result, Texas academic, public, and school libraries in particular are at an increasing disadvantage in their ability to offer wide-ranging, up-to-date information services.

Nationally in 1992*, states on average spent twice as much per capita on all types of libraries than did Texas and the comparison for public libraries is significantly worse.

	U.S.	Texas
average state expenditure per capita (all libraries)	$2.68	$1.13
average state expenditure per capita (public libraries)	$2.35	$ .01*
average local expenditure per capita (public libraries)	$15.39	$10.11
average state expenditure total spending 1990 in millions (academic libraries)	$3,258	$217

* The Chief Officers of State Library Agencies (COSLA) reported an average state expenditure that is somewhat higher -- $.28 -- but still substantially below the national average.

Given the benefits that libraries offer in education, training, and overall information services, the resulting limitation on libraries is shortsighted. Every college or university needs an academic library that combines comprehensive print resources with current network applications and information databases, every school needs a library media center that incorporates a variety of digital resources into the curriculum, and every community needs a public library that can continue more traditional library services while offering everyone access to at least some elements of the information highway. Clearly, for libraries to meet the information needs of Texans in the 21st century, and for the state to meet the goals of a healthy economy and citizenry, state and local governments need to increase funding to libraries.

* The last year for which all data is available.

Entrepreneurs

Even with increased budgets, libraries will struggle to manage the transition from print to electronic information services. Considering that the need to stretch dollars and to cut costs inspired much of the reinventing government movement in the first place, entrepreneurial tactics are obvious avenues for alleviating some of the fiscal stress. To afford advanced electronic services, libraries will have to expand efforts to reallocate resources. Communication with users and staff will inform decision makers about what kinds of services will be helpful, what kinds of cuts will be acceptable, and how to guard against exclusionary effects. Canceling subscriptions to print copies of rarely used journals, for example, will offset a subscription to popular electronic journals.[155] Such reallocation decisions free up revenue for innovative services that increase user support and leverage additional funding.

Additionally, assertive marketing efforts will persuade public and private sources to reward libraries with grants and financial support. These efforts should be viewed by both sides as trading assets. Accordingly, fund raisers should point out how support for library services will benefit or educate the donor's employees or associates, how support will be tax deductible or provide public recognition to the donor, or how support will enhance public or private initiatives or appeal to a sense of corporate or civic duty. A library seeking donations of computers from companies, for example, should demonstrate how they can help employees with research skills or information, or how many patrons will see the sign with the donor's name that the library places next to the computer.[156] Similarly, libraries seeking public grants for networks should show officials how libraries already are contributing to communities and to the development of information infrastructure, as well as what libraries would do with public money.[157] On the other hand, donors should recognize the benefits libraries confer and the restraints under which they are currently operating and should contribute what they can to support information services.

Yet, when technology makes the idea of a virtual library sound plausible, more than sound management and public relations will be necessary for libraries to adapt to fiscal reality. The changing environment raises questions about appropriate permanent fund-

ing sources. When a global audience can dial-in to a local OPAC, should local taxes or student tuition still be the primary funding source? Conversely, when local users can access global resources, is it fair for them to pay only what is necessary to operate that library if users in another area pay more to contribute to the same global pool of resources? The evaporating boundaries call for additional support from state and federal governments with broad geographic jurisdictions to further supplement local funding. However, while library leaders should actively pursue grants and subsidies, in light of shrinking budgets and the prevailing trend toward user fees throughout the public sector, it is unrealistic for most non-profit libraries to ignore independent funding sources. Therefore, under pressure from the rising costs of publications, and the need to balance continued access to print collections with new electronic services, all librarians eventually confront the "free versus fee" issue when planning library operations.

Free Versus Fee

The debate is usually framed in terms of providing traditional free service versus charging user fees. Although in general librarians oppose fees, many libraries already impose them. Among other things, they charge for photocopying, interlibrary loans, computer searches, and nonresident or unaffiliated use of the library. These charges usually are justified as something the user can avoid paying by substituting their own time or effort.[158] To most users, other library services appear free when, in reality, libraries subsidize access to the "information commons." Continuing the subsidy in the digital age, however, will not be easy. Besides staff time devoted to learning how to use the latest resources, to organizing access to those resources and to teaching patrons how to use them, expenses include equipment purchases, fees for the connection, and long distance charges. Especially in the short term when libraries still feel obligated to maintain a collection of printed materials, budgets may not allow for fully subsidized access to electronic information.[159]

Thus, proponents feel that there is a strong case for imposing fees if libraries are to provide a full range of services. Fees offset costs for supplemental services and encourage libraries to be more "market driven," and hence more responsive, to patrons.[160] If they are levied

against people who do not pay local taxes or tuition, or are applied only to supplemental services, inequity is minimized. From an efficiency perspective, they discourage people from using expensive services unless needed, acting as a rationing mechanism and freeing librarians to serve those who will benefit most. Dedicated to new services or particular goals, fees support library development and encourage sound management.[161]

On the other hand, if libraries, especially public, academic, and school libraries, are forced to charge for services, they inevitably will limit some people's access to information. For this reason, many librarians are adamantly opposed to fees as antithetical to the mission of public or quasi-public libraries.[162] Opponents also argue that community residents and university students already have paid for library services in the form of taxes and tuition. Fees add administrative costs, bear too strong a resemblance to competition with the private sector, and discourage use of the library. They dilute libraries' uniqueness to the community and, therefore, constitute an unadvised marketing maneuver. Moreover, there is concern that a "market driven" library will not care about the needs of the disenfranchised. In sum, the contention is that, since libraries are a public resource, they should be subsidized out of general revenues.[163]

The emergence of networks and electronic information is heating up this controversy. Concerns about abandoning information have nots and about libraries lacking the resources to keep pace with new information services fuel both sides of the argument. In the current environment, with government support unlikely to increase substantially, compromise is necessary for libraries long-term effectiveness.

Is Information a Public Good or a Commodity?

The "free versus fee" debate results from information's dual role as a public good and a commodity. Information exhibits nonrival and nonexcludable qualities, the two characteristics defining a public good. Even in print form, information can be known and used by more than one person at a time, and once it is made public, the originator cannot control its use. The fluidity of digital formats exaggerate these public good characteristics. Furthermore, using and adding to information benefits society as a whole, conferring

educational and economic externalities. It is a shared public resource, like parks and recreation facilities, and hence, every citizen should have access to a certain minimum amount.[164]

To the extent information is a public good, access to it deserves to be subsidized. This conclusion explains to some extent the rationale behind free public education and library use. Proponents of free library service contend that conditions still warrant these safeguards. Just as intellectual property laws have to be reshaped to fit digital formats, library services and funding have to be updated to guarantee free access to digital information; and just as creators and publishers deserve assurance of profit-making potential, every citizen in a democratic society deserves assurance of access to the information commons through free library services.

Conversely, proponents of user fees contend that, to the extent information is a commodity, users should have to pay for access to it. As a private good, information can be defined, measured, and exchanged, for a price. Users receive private benefits, and often these benefits are financial in the form of better jobs, higher wages, higher productivity, or more profits.[165] In the library context, they argue, relatively insubstantial fees would not burden most users, who are middle class, and would relieve the poor of the library's tax or tuition burden.[166]

Reality is probably somewhere in between. People need access to a certain amount of information to function in the democracy and in the economy. In the high-tech, information age, they need to be literate in using computers and networks, and in finding, filtering, and applying information. Libraries, in conjunction with schools, ensure the security of the safety net that guarantees this access, plus the external benefits society receives from a creative, informed, and productive populace. Therefore, basic library services corresponding to information as a public resource, like elementary and secondary education, should be widely available at little or no cost.

Nonetheless, when governments and institutions struggle to provide funding for sufficient hours of operation, staff and resources for the provision of basic library services, there is little justification for subsidizing access to profitable information. Although it can be difficult to define when information is functioning as a public good or as a commodity, some library services lend themselves to the

distinction. For example, charging a fee for time-saving services such as computer searches does not prevent financially-strapped individuals from conducting the search on their own. At the same time, the service may attract people who normally do not use the library because they do not have the time to conduct laborious research. Similarly, charging for services such as dial-in access to the computer's network connection gives the library some financial flexibility to experiment without erecting barriers to in-library use.[167]

Higher Education Model

Some academic librarians view fees, especially those imposed in tiered pricing schemes where different users pay different prices, as a necessary evil if libraries are to survive in the networked environment.[168] The higher education system in which they work may provide a framework for designing tiered structures applicable to all libraries.[169] Students who attend elite private colleges or universities pay more, but they also compete for admission and expect to receive the necessary skills and connections to embark on successful and lucrative careers. Likewise, students who attend a community college pay less, face little competition for admittance, and expect smaller, although not insignificant, rewards from their investment.

Applying the analogy to libraries, the more skill needed to use a service and the more return on the investment expected to result, the more a library should charge, with financial aid available for the needy and meritorious. A special library with the best digital collection of neurology research will attract the best information professionals with expertise in that area, and therefore users prepared to use and pay for that quality of information. An academic library with a specialty in American history will charge less than the neurology library for advanced research services, and will compete with other libraries of similar caliber. A public library that excels in teaching patrons how to use network applications will charge for that service, because it is a practical skill that the recipient then can market.

Of course, fees are not a panacea. Even universities able to charge high tuition seek outside funding. Instead, like OPACs, the Internet, allusions to reinvention, and shared resources, they are signs of the times. Like other components of library evolution, an effective fee structure should sustain quality services and discourage

expensive duplication, while supplementing a safety net that continues to ensure equitable access to a broad range of print and electronic information resources and the opportunity to develop adequate information literacy skills.

CHAPTER 5

Recommendations and Conclusions

Information technology will affect everyone. Library services benefit everyone, even those who do not directly use libraries. Therefore, it is important for the different sectors involved with libraries to understand the dynamic context in which libraries operate and to work together to ensure the continued health of a vital institution. This chapter lists recommendations for accomplishing these goals.

Access

Recommendation 1: *Librarians, policy makers, and financial supporters should focus on the goal of universal information literacy.*

As information services undergo evaluation and redefinition, library and government decision makers should follow a framework that emphasizes information literacy. This perspective requires policies and resources supportive of all libraries with an educational focus. Given the opportunity to use the full range of their expertise, public, academic, and school librarians then will be able to provide functional access to networks and information by explaining navigational skills, as well as by facilitating public access to the Internet, CD-ROM databases, and other electronic resources. By offering practical assistance in using and assessing information resources, librarians will be able to broaden the definition of "access" to include information and network literacy. This focus will secure libraries'

position as essential gateways to fundamental and valuable resources.

> Recommendation 2: *The Texas State Library should take the lead in assisting public libraries to at least obtain network connectivity.*

Whether through coordinated or individual efforts, libraries must deliver programs that start or expand access to the technology and information resources transforming society. Tex-Share is helping some academic libraries achieve this goal; TENET and the Texas Library Connection are laying the foundation for library media centers. Public libraries need similar assistance from TSL. Like other statewide efforts, a TSL program guaranteeing public library connectivity would demonstrate a commitment to equity and would move Texas closer to achieving its vision of an educated, healthy, economically sound state.

Virtual Library

> Recommendation 3: *The library community should ensure that the vision of the virtual library* includes a full range of information services.

The fact that this future entity is described as a library indicates the expectations that it will be more than a digital version of a bookstore. With so much information at hand, the demand for organization and reference assistance will be even greater, and the value of fostering substantive applications will be inestimable. To capitalize on these opportunities, librarians must make it a point to become experts in networked technology, familiar both with what material is available and with what assistance patrons will find beneficial in the future.

Entrepreneurial Spirit

Recommendation 4: *To adapt to rapid technological advancements and to the changing political and economic climate, all libraries should become more entrepreneurial.*

Librarians typically are not business-oriented, and it is not necessary for every library to become a commercial enterprise. However, to establish themselves as innovative and essential, libraries need to find ways to offer patrons at least basic digital services. While federal, state, and local government support will be essential in this endeavor, it is unrealistic to rely solely on such assistance. Entrepreneurial methods will enable libraries to initiate and maintain programs that are most beneficial to their clienteles.

Recommendation 5: *Librarians should consistently think of users as customers.*

Librarians must reach out to customers to learn what they need or desire and what they think of existing or proposed services. In return, customers should be more willing to "pay" by showing appreciation through donations, volunteering, and expressions of support to funding bodies.

Recommendation 6: *Librarians must acquire the skills necessary to strive for innovation while keeping an eye on the bottom line.*

Libraries should not be prevented from acquiring a needed resource just because no statewide or regional effort exists to provide it, or because no excess money is available to buy it. Instead, by adopting an entrepreneurial spirit, librarians will seek alternative revenue and make difficult choices to eliminate less useful programs in order to fund more relevant ones. The goals of responsiveness and accountability will guide libraries in these decisions. Enhanced business training, through continuing education and Master's of Library Science classes and seminars in topics such as management, finance, marketing, and grant writing will help librarians achieve these goals. Effectively using entrepreneurial tactics to affect change and to establish their own niche will help libraries to become more competitive in the information arena.

Collaboration

Recommendation 7: *All information service providers need to be receptive to collaborative relationships.*

Libraries have a history of cooperation among themselves. Academic and school libraries already are benefitting from network applications of this tradition through Tex-Share and the Texas Library Connection. All libraries need to continue this custom and to extend it to other sectors and organizations that in turn should appreciate the potential of interdisciplinary collaboration. By reaching out to entities, such as community networks, government agencies, or other departments within their institutions, not only will libraries learn more about what their communities need from them, they will demonstrate their value to others. They will convey the image of a multi-faceted institution and will cultivate allies who have a vested interest in libraries' success. These allies will be essential in expanding libraries' influence and in leveraging public or private dollars.

Advisor for Information Policies

Recommendation 8: *Policy makers and librarians should collaborate in the development of information policies.*

Policy makers have to revise existing intellectual property and telecommunication rules and regulations to conform with digital formats. Librarians' expertise should be an essential part of this process. Librarians should exert as much influence as possible to see that new laws will support library services and ensure equitable access. In this way, they will make their own jobs easier and demonstrate to the public and to policy makers the value of librarians' roles as advocates and information experts.

Funding

Recommendation 9: *All levels of government should increase funding to libraries.*

Despite Texas' emergence as a high technology leader, governments at the state and local levels generally allocate less funding to libraries than is available in other states. As a result, Texas libraries are at an increasing disadvantage in their ability to offer comprehensive, up-to-date information services. Given the benefits that libraries offer in education, training, and overall information use, the resulting limitation on libraries is shortsighted. Clearly, for libraries to meet the information needs of Texans in the 21st century, and for the state to meet the goals of an attractive economy and an informed citizenry, funding should be raised to more competitive levels.

Recommendation 10: *Libraries must actively and independently seek alternative funding sources.*

Like managers of any enterprise, librarians must look at a variety of funding sources. They should enhance any budget increases by actively seeking ways to free up or raise revenue to finance Internet connections, training, and other expenditures necessary to establish libraries as innovative and vital institutions in the digital age.

Entrepreneurial and collaborative efforts should make libraries more attractive to private donors and more competitive in the quest for government appropriations and grants. Receiving support from one source often will leverage support from others. Combined with the reallocation of resources, these funds will enable libraries to buy new equipment and resources and to implement new services. As the services become entrenched, and backed with demonstrated support, libraries then will be in a stronger position to expand services and to seek increased budget support.

Recommendation 11: *Since it is unlikely that many libraries will receive enough money to satisfy demand for high-quality digital services, libraries should consider expanding user fees.*

The key to expanding fees is to do so without abandoning equitable principles. Limiting fees to supplemental services or to nonresident or nonaffiliated use, for example, will not restrict access

to users whose taxes, tuition, or businesses already subsidize the library. Alternatively, following the tuition framework of the higher education system, libraries that offer access to specialized expertise, marketable skills, or services that promise a return on an investment should consider charging accordingly. As long as the 21st century library equivalent of elementary and secondary education, such as public access to the Internet or general reference assistance, remain free, libraries will not be abandoning their safety net obligation. Instead, they will be offering quality supplemental services, leaving it up to patrons to decide if the expected return justifies the investment.

Further Research

Recommendation 12: *Further research should be conducted on library contributions, concerns, and needs.*

Due to the broad subject matter of this report, there are many generalizations and unanswered questions. Additional research should be undertaken about each type of library in Texas. For example:

- What kind of digital information services should public libraries provide? How are they paying for them?
- How are library media centers using network technology? What exactly do they need to use it better?
- How is Tex-Share affecting users of academic libraries? What digital services do students and faculty need or want?
- What are the unique needs and advantages of special libraries in Texas?

Additional research also should be conducted into the issues raised by this study. Data describing factors such as consumer preferences, services used, and revenue saved should be collected.

Then analysts can research questions such as how much money has been saved from reallocating resources or from adopting technology.

- What are the administrative costs of imposing fees?
- What kind of services have been saved or started by the imposition of fees in other states and in other countries?

Also, success stories from the use of Texas libraries should be assembled and publicized. Case studies, data analysis, and policy proposals published in library and non-library sources to reach a diverse audience will call attention to library contributions and needs and illustrate how to optimize available resources.

Conclusion

Libraries are at an historic juncture. They have a distinguished tradition of service, but an uncertain future. Libraries are found in so many communities, organizations, and environments that it is hard to imagine a world without them, yet futurists do it quite often. In this future world, every building is connected to the lauded information highway, and all information is accessible through it. This scenario is far from today's reality, but the fact that it is discussed, and possible if not plausible, signifies the challenge libraries face to redefine themselves as modern enterprises.

Few disagree that libraries have been worthwhile endeavors. They have provided access to books, journals, computers and other information resources; they have added value to assembled resources through selection, organization, and user assistance; they have offered relaxed introductions to new equipment and to new ideas. Perhaps most importantly in a democratic society, they have served as information equalizers, guaranteeing every individual, every student, and every business access to information resources and services. Furthermore, they have provided these services through decades, even centuries, of change. Hence, libraries' history is a resource in itself, illustrating how and why the institution has prevailed.

Nevertheless, there seems to be an emerging doubt about the long-term relevance of libraries. Despite the print and electronic information that libraries continue to offer and the number of people who continue to use them, some commentators are beginning to view

the physical version as a dated institution having minimal relevance to essential social and economic goals in the digital age. This dichotomy may explain why a common vision of libraries of the future is a virtual, not an actual, library contained in computer chips and telephone wires. If libraries and librarians are to prosper in the 21st century as vital information providers, they need more funding. To attract more funding, they need to change their image, update their services and their thinking, and demonstrate more vividly the value that they add to print and digital information.

It is in society's best interest that libraries be capable of capitalizing on information's educational, economic and technological features. More than ever before, jobs, businesses, and industries depend on up-to-date information. Computer and telecommunication advancements are making it easier to create and exchange information. Together, these trends are precipitating an information explosion. The rate of change and the volume of information present excellent opportunities for libraries, with the support of communities, business, organizations, governments, and individuals, not only to survive in the networked information age, but to successfully log another chapter onto a history of service as a public, economic, and civic resource.

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